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The Commonwealth of Massachusetts

ANNUAL REPORT

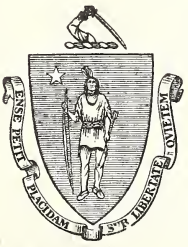
OF THE

Division of Fisheries and Game

FOR THE

YEAR ENDING NOVEMBER 30, 1939

1939



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DEPARTMENT OF CONSERVATION

20 Somerset St., Boston

Commissioner, Ernest J. Dean, Chilmark

Division of Fisheries and Game
Director, James E. Agnew, Boston

Office Administration:

J. Arthur Kitson, Fish and Game Biologist
Carl G. Bates, Chief Conservation Officer.
Orrin C. Bourne, Supervisor of Fish and Game Permits and Claims.
Joseph A. Hagar, Ornithologist.
Arthur Merrill, (Field) Fish Culturist.
Harold M. Bradbury, (Field) Game Culturist.
*Allan S. Kennedy, Junior Fish and Game Biologist.
Arnold E. Howard, Field Agent Division of Fisheries and Game.

Technical Consultants

Dr. Hugh P. Baker, President, Massachusetts State College, Amherst.
Prof. Samuel C. Prescott, Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge.
Prof. R. P. Holdsworth, Head of the Department of Forestry, Massachusetts State College, Amherst.
Mr. Fred A. McLaughlin, Massachusetts State College, Amherst.
Mr. Ludlow Griscom, Research Curator of Zoology, Museum of Comparative Zoology, Harvard University, Cambridge.
Dr. David L. Belding, Boston University School of Medicine, Boston.
Prof. James L. Peters, Curator of Birds, Museum of Comparative Zoology, Harvard University, Cambridge.
Dr. Ernest E. Tyzzer, Department of Comparative Pathology, Harvard University, Cambridge.
Prof. F. J. Sievers, Director Experiment Station, Massachusetts State College, Amherst.

* Standish Deake, Junior Fish and Game Biologist Dec. 1, 1938 to Apr. 18, 1939; Dr. Benjamin B. Leavitt, Junior Fish and Game Biologist Apr. 19 to July 31.

The Commonwealth of Massachusetts

Department of Conservation,
20 Somerset St., Boston, Mass.

To His Excellency Leverett Saltonstall,
Governor of the Commonwealth of Massachusetts,
State House, Boston, Mass.

Sir:

I have the honor to submit herewith for the information of Your Excellency and the Legislature, the seventy-fourth annual report of the Division of Fisheries and Game as submitted by James E. Agnew, Director of the Division of Fisheries and Game.

Respectfully,
Ernest J. Dean, *Commissioner*

The Commonwealth of Massachusetts

Department of Conservation,
Division of Fisheries and Game,
20 Somerset St., Boston, Mass.

Mr. Ernest J. Dean,
Commissioner of Conservation,
20 Somerset St., Boston, Mass.

Dear Sir:

I hereby submit the seventy-fourth annual report of the Division of Fisheries and Game, Department of Conservation, outlining the Division's activities for the year ending November 30, 1939.

Respectfully submitted,
James E. Agnew, *Director*

Reorganization

A reorganization of the Department of Conservation, of which the Division of Fisheries and Game is a part, was effected by the enactment of Chapter 491, Acts of 1939. This law provides for a Department of Conservation consisting of a Division of Forestry, a Division of Fisheries and Game, a Division of Wildlife Research and Management, a Division of Marine Fisheries, and a Division of Parks and Recreation, each under the charge of a Director. The Department is to be under the supervision and control of a Commissioner of Conservation, with the Directors acting as an advisory council to the Commissioner.

While the bill was effective as of August 12, the actual work of reorganization will occupy considerable time and will not be completed until after the time when (on or after January 30, 1940, as specified by law) the Governor shall have appointed directors for certain of the Divisions.

For this reason, although the Commissioner of Conservation has (except in the case of marine fisheries) designated temporary directors, as authorized by the law, to carry on the work in the period from August 12, 1939 until the

permanent organization has been completed, the reports of the work of the new Division of Wildlife Research and Management to the close of the present fiscal year, is included in the report of the Division of Fisheries and Game as a matter of convenience. The activities along the line of marine fisheries for the entire year 1939, however, being largely of a statistical nature and thus difficult to divide, are published in a separate report.

Finances

Although, as a matter of fact, the work relating to marine fisheries was organized as a separate division in the Department of Conservation on August 12, 1939, the statements of appropriations and expenditures, and of revenue, are presented in this report covering both inland and marine fisheries activities, as well as the work on wildlife research and management, for the full period of the fiscal year 1939. Inasmuch as the Division of Fisheries and Game functioned in its old form (covering inland and marine fisheries) for 8½ months, the larger part of the year, and minus the marine work for only 3½ months, there seems to be no urgent need to divide the revenue table at this time, particularly as no separate accounting systems have thus far been set up.

Finances

Appropriations and Expenditures

	Appropriations (as reduced)*	Balances from 1938, and transfers	Expenditures	Balances to 1940	Balances to State Treasury
Part I (1938 revenue, $299,594.02)					
Salary of the Director	$5,000.00	–	$5,000.00	–	–
Office Assistants	22,300.00	–	22,015.44	–	$284.56
Office Expenses	9,790.84[1]	$28.57	9,505.74	$42.37	271.30
Education and Publicity	984.31[2]	94.47	1,054.76	–	24.02
Enforcement of Laws:					
Personal Services	75,300.00	–	74,619.32	–	680.68
Expenses	31,754.73[3]	344.32	28,353.79	1,000.00	2,745.26
Special: Hurricane and Flood Damage	–	2,537.57	605.25	1,932.32	–
Biological Work:					
Personal Services	6,900.00	–	6,866.58	–	33.42
Expenses	2,859.09[4]	277.55	2,928.79	75.00	132.85
Propagation of Game Birds, etc.:					
Personal Services	79,400.00	–	74,357.85	–	5,042.15
Expenses	99,960.15[5]	7,449.69	105,975.98	300.00	1,133.86
Special: Hurricane and Flood Damage	–	47,822.84	42,333.21	5,489.63	–
Supervision of Public Fishing and Hunting Grounds:					
Personal Services	5,150.00	–	5,084.00	–	66.00
Expenses	1,091.66[6]	–	766.09	–	325 57
Establishment of Public Fishing Grounds	3,009.84[7]	204.50	1,314.68	–	1,899.66
Damage by Wild Deer and Wild Moose	6,000.00	–	2,785.96	–	3,214.04
Special: Construction and Improvement of Certain Fishways	3,986.89[8]	1,293.48	2,995.94	20.00	2,264.43
Part II (1938 revenue, nothing)					
Protection of Wildlife:					
Personal Services	4,700.00	–	4,700.00	–	–
Expenses	1,422.44[9]	942.89	2,352.94	–	12.39
Part III (1938 revenue, $10,211.96)					
Marine Fisheries (including Sale and Cold Storage of Fresh Food Fish):					
Personal Services	30,285 00	–	28,139.36	–	2,145.64
Expenses	8,634.52[10]	88.46	8,051.48	95.00	576.50
Special: Hurricane and Flood Damage	–	4,000.00	–	–	4,000.00
Enforcement of Shellfish and other Marine Fishery Law:					
Personal Services	34,205.00	–	34,134.25	–	70.75
Expenses	13,945.06[11]	248.93	14,087.68	–	106.31
Purchase of Lobsters	2,086.00	–	86.00	–	2,000.00
Assisting Coastal Towns, etc.	19,945.57[12]	34.50	18,670.99	325.00	984.08
Purchase of Land	50.00	–	–	50.00	–
	$468,761.10	$65,367.77	$496,786.08	$9,329.32	$28,013.47

*The appropriations made by Chapter 309, Acts of 1939 were later reduced, in accordance with Chapter 387, Acts of 1939, by the amounts in the following foot-notes:

1. $9.16
2. 15.69
3. 45.27
4. 40.91
5. 39.85
6. 108.34
7. 30.16
8. 13.11
9. 77.56
10. 65.48
11. 54.94
12. 54.43

Revenue

Following is the revenue accruing to the State Treasury for the period of the fiscal year, from the activities of the Division.

	Part I Produced by the hunters, anglers and trappers	Part II Produced by those who enjoy wildlife but do not hunt, fish or trap	Part III Produced by the marine fisheries
LICENSES: PART I			
Hunting, fishing sporting and trapping license fees $330,532.75 (less $80 refunds to town clerks on account of overpayments on 1938 accounts)	$330,452.75		
Shiner permits	540.00		
RENTS:			
Property at Marshfield, Palmer, Sandwich, Sunderland, Wilbraham	626.00		
SALES:			
Confiscated goods, $27.90; raccoon pelts, Ayer Game Farm, $55.40; game tags, $215.00	298.30		
MISCELLANEOUS:			
Automobile damage claims, $68; easement at Wilbraham Game Farm to Socony Vacuum Oil Co. to lay a pipe line, $280; refund, prior year, on Federal grant, $593	941.00		
FINES:			
Turned into State Treasury as a result of violations of the inland fish and game laws	4,802.00		
PART II			
Nothing		Nothing	
LICENSES: PART III			
Lobster and crab licenses			$5,196.50
Lobster meat permits			1,870.00
Shellfish dealers' shipping certificates			890.00
Shellfish diggers' shipping certificates			30.00
RENTS:			
Lease of Chilmark pond, $1.00; clam flats, $10			11.00
SALES:			
Clam rings and lobster rules			2.50
MISCELLANEOUS:			
Automobile damage claim, $4.80; refund prior year, gasoline tax, $5.01			9.81
FINES:			
Turned into the State Treasury as a result of violation of marine fisheries laws			1,903.50
Total, $347,573.36	$337,660.05	Nothing	$9,913.31

Approved.

GEORGE E. MURPHY,
Comptroller.

DETAIL OF RECEIPTS FROM LICENSES TO HUNT, FISH OR TRAP
(for fiscal year Dec. 1, 1938 to Nov. 30, 1939)

	Number	Gross Amount	Fees Retained by Clerks	Net Return to State
Resident Fishing ($2.00)	71,174	$142,348.00	$17,515.50	$124,832.50
Resident Hunting ($2.00)	51,418	102,836.00	12,754.25	90,081.75
Resident Sporting ($3.25)	26,500	86,125.00	6,546.25	79,578.75
Resident Minor and Female Fishing ($1.25)	17,291	21,613.75	4,272.00	17,341.75
Resident Minor Trapping ($2.25)	547	1,230.75	136.75	1,094.00
Resident Trapping ($5.25)	1,486	7,801.50	370.50	7,431.00
Resident Sporting (Free)	8,028	–	–	–
Special Non-Resident Fishing ($1.50)	933	1,399.50	231.50	1,168.00
Non-Resident Minor Fishing ($2.25)	47	105.75	11.75	94.00
Non-Resident Fishing ($5.25)	765	4,016.25	188.50	3,827.75
Non-Resident Hunting ($10.25)	401	4,110.25	98.50	4,011.75
Non-Resident Sporting ($15.25)	25	381.25	6.25	375.00
Non-Resident Trapping ($15.25)	6	91.50	1.50	90.00
Duplicate ($0.50)	1,178	589.00	–	589.00
Special Non-Resident Fox Hunting ($2.00)	10	20.00	2.50	17.50
Totals, sporting, hunting, fishing and trapping licenses, including duplicates	179,809	$372,668.50	$42,135.75	$330,532.75
Deduct refunds made on account of overpayments by town clerks on 1938 licenses	–	–	–	80.00
				$330,452.75
Lobster and crab	1,094	$5,470.00	$273.50	$5,196.50

The following statement of the number of hunting, fishing and trapping licenses (excluding 1,158 duplicates) sold in each county during the calendar year 1938, will indicate the distribution of license sales throughout the State. It is not an indication of the amount of hunting, fishing or trapping which is carried on in each county, since the licenses may be used in any part of the State. As the figures are for the calendar year, the totals will not check with the license data for the fiscal year in the annual report of 1938.

Barnstable County, 3,521; Berkshire County, 17,963; Bristol County, 8,894; Dukes County, 412; Essex County, 10,428; Franklin County, 7,089; Hampden County, 22,355; Hampshire County, 7,575; Middlesex County, 19,229; Nantucket County, 351; Norfolk County, 10,723; Plymouth County, 8,561; Suffolk County, 6,843; Worcester County, 38,109; total, 162,053.

Conventions and Meetings

The Director and other officials and executives attended numerous meetings, of which the following are typical, where problems of fish and game conservation were the subject of discussion. Likewise many meetings with the various sportsmen's clubs, men's clubs, granges, and other organizations throughout the State.

A meeting in Boston of a group of men from the U. S. Biological Survey and from various States, who are concerned in activities under the Pittman-Robertson Act, by the terms of which the United States Department of the Interior offers to cooperate with any State in the acquisition and restoration of wildlife environment, or in research which has a practical bearing on the restoration or productive use of environment. There was a general discussion of work under way, of methods of correlating work on closely related problems, and suggestions were advanced for methods of more effective direction.

The joint meeting in Boston of the Massachusetts Audubon Society and the New England Bird Banding Association.

The Eleventh Annual New England Game Conference, held in Boston under the auspices of the Massachusetts Fish and Game Association, and the Third Northeastern Wildlife Conference.

The Sixth Annual Outdoor Recreation Conference, held at the Massachusetts State College, Amherst. The Director presented a paper on "Conservation Problems," and the Ornithologist contributed one on "The Pittman-Robertson Program and What it Means to the Sportsmen."

Education and Publicity

Exhibitions demonstrating the work of the Division in the conservation of fish and game, were conducted under the direction of Mr. Orrin C. Bourne, as follows:

February 4-12, New England Sportsmen's and Boat Show, Mechanics Building, Boston. The same space was allotted as in several years past. With the assistance of Ornithologist Joseph A. Hagar, Mr. Howard M. Bradbury, and Conservation Officers Waterhouse and Moriarty, an educational exhibit was arranged. One-half of the space was used to portray a salt marsh showing waterfowl and shorebird restoration projects. A slough hole was shown fully drained and dried out for mosquito control, leaving no food for birds. Another slough hole, close by, showed a restored tide-swept pool that would contain water and food, and yet give mosquito control. A number of birds common to these spots (mounted) stood near this second pool to show that they could be attracted and fed by making the slight change of arranging a small sod dike at the outlet.

The other side of the space showed a reproduction of a winter duck-trapping project, such as is being conducted under the Pittman-Robertson Federal Act to assist in a study of the feeding locations and feeding habits of the northern black duck, particularly those that winter in Massachusetts. A trap holding some of the northern black ducks was exhibited, as well as metal identification

bands such as are placed on the trapped birds before they are liberated. Several large display cards, sketches and maps described the project and its anticipated results. A salt marsh background, painted by Mr. Egbert Hans of the Department, added a realistic touch to this effort to demonstrate a little-known phase of the wildlife work. At the close of the show (on February 12, about midnight, at the Wellington Bridge, Mystic River) the trapped ducks above referred to were liberated. Band No. '39-634,000 from one of these ducks was returned to the Bureau of Biological Survey with the report that the bird was shot on September 14 at the Lower St. Lawrence River, Quebec, Canada.

February 27-March 4, the Sport Show at the Municipal Auditorium in Springfield, under the auspices of the East Longmeadow Rod and Gun Club, General Manager Mr. Louis A. R. Pieri. The Division's exhibit was on the back of the stage, and comprised cages with pheasants and quail, glass aquariums with trout in running water, and the oxygen tank demonstration with the larger trout.

March 10-12, Physical Education Building, Massachusetts State College, Amherst. At the sixth annual Outdoor Recreation Conference the material used was the same as at Springfield, Worcester and other small shows.

March 20-26, the Sportsmen's Show, Memorial Auditorium, Worcester, under the direction of Mr. Louis A. R. Pieri, general manager for the Worcester County League of Sportsmen. To avoid danger of losing fish or causing damage by overflow, this exhibit was arranged without the glass aquariums and running water, and was limited to the oxygen tanks and cages of quail and pheasants.

April 1-3. A three-day show was put on at the Southbridge Town Hall for the Hamilton Rod and Gun Club.

June 1-September 1. At the request of the Massachusetts Industrial and Development Commission, an exhibit was staged in the State Building at the Eastern States Exposition Grounds and carried through the summer by that Commission as a Federal project. Paintings (6 feet by 9 feet) were set up showing game farms, fish hatcheries, and an airplane view of the Merrill State Pond System at West Sutton, together with cards explaining what they represented. Two paintings on sporting subjects—trout fishing and duck hunting—were set up at another section. The balopticon lantern with seventy lantern slide views occupied a space near by, and afforded an opportunity of seeing more of the game farms, fish hatcheries, and sporting scenes. This exhibit ran until the first of September, when it had to be broken up in order to assemble an exhibit for the regular Eastern States Exposition week.

September 9-16, Brockton Fair. At the Brockton Fair Grounds the Conservation Department set up its exhibit, and this Division was allotted triangular spaces at each end to fill in. In one section were set a cage with pheasants and one with quail, and a buck's head with a sign warning of the dangers incident to hunting, while the opposite side was given over to a marine fisheries exhibit. This comprised enlarged photographs from the office of the State Supervisor of Marine Fisheries, and in the center a mechanically operated model of a dory with a fisherman on a stormy sea, to call attention to the great value of the deep sea fisheries to Massachusetts and its inhabitants. Backgrounds of cloth concealed the brick walls and set off the exhibit.

September 17-23. The Brockton Fair ended at 10 o'clock on September 16, and the Eastern States Exposition at West Springfield commenced at noon the following day, requiring a special trip to Brockton for material for the second show.

The exhibit was similar to the one put on in 1938 (which, on account of conditions brought about by the hurricane, was open to the public for only part of three days). This year's display included, as a new feature, an exhibit of sporting goods appropriate for hunting and fishing with particular reference to Massachusetts. The principal attraction demonstrated the tying of the various artificial flies and other lures,—the first showing of anything of this sort in the State Building or on the exhibition grounds. The ducks and geese exhibited in the old gunner's camp were loaned by the Forest Park in Springfield,

and were cared for by Mr. Wallace Simpson, for which service acknowledgement is made to him and to the Park Department.

September 28, Stow. A small display was set in the new Conservation Service Building at Stow as part of a permanent exhibit by the various divisions of the Conservation Department, and shown for the first time at the dedication exercises held on that date.

Throughout the year small shows were put on for club field days, and the balopticon with slides has been set at various times for Boy Scout exhibits.

The usual routine lecture work was carried on by the men of the division, each on his particular line of work,—by the Director; by the Biologist and the Junior Fish and Game Biologist; by the Chief Conservation Officer; by the Ornithologist and his assistant, Mr. Harold M. Bradbury; by Mr. Orrin C. Bourne on the work in general; by the heads of the marine work; and through the year the conservation officers addressed groups of school children, clubs, and gatherings of various kinds.

ENFORCEMENT OF THE GAME AND INLAND FISH LAWS

Work of the Conservation Officers

Veteran Fish and Game Warden Nathan W. Pratt died April 4, 1939, after having served continuously from the date of his appointment in May, 1910 until his retirement February 18, 1933. The passing of Mr. Pratt takes from the retired enforcement personnel one of the most gentlemanly and upright officers ever connected with the work, and one who held the respect of his associates and the public alike to an extent seldom equalled where enforcement work is involved.

Effective January 23, a new district was set up, formed by the towns of Hudson, Marlboro, Stow, Berlin, Bolton, Boylston, Northboro, Shrewsbury, Southboro, Westboro and Clinton, comprising an area of 178.14 square miles. Conservation Officer Wendell Poitras was relieved of his work on Cape Cod and assigned to the new district until such time as an appointment can be made from a Civil Service eligible list.

The creation of this new district was an effort to remedy a situation that has long been bad, and which added to the normal difficulties of law enforcement. There were four adjoining districts, each of which was too large for proper patrol, and in addition were of such a shape as to require an undue amount of travel by the conservation officers patrolling them. Since the rearrangement of this area, not only has the enforcement work in the area of the new district improved, but the reduction of the size of the adjoining districts has proportionately improved the enforcement work there also.

The patrol work on the public fishing ground areas required the same number of men as in other years, one temporary conservation officer being assigned to the Farmington River, one each to the Millers and the Squannacook, and four men to the Westfield River System, namely, one on the West Branch, one on the Middle Branch, and two on the East Branch.

Although snow came early in the winter with a severe storm at Thanksgiving time in the western part of the State, measuring a foot or more, heavy snows did not prevail throughout the winter, and therefore the work of feeding the wildlife was reduced to a minimum, and it is unlikely that game birds or mammals suffered from lack of food owing to any unusual winter conditions.

There were 90 deer killed accidentally and in the following manner: by automobiles, 59; dogs, 11; railroads, 5; illegally taken, 4; found with broken leg, 1; found with broken neck, 2; shot by officer, 2; went through a window, 1; hurt while jumping fence, 1; found in brook, 1; found dead, 3. The policy of distributing venison to welfare recipients or to hospitals was continued whenever the condition of the meat warranted such action; otherwise the carcasses were destroyed.

The hunting and fishing seasons opened on schedule. Contrary to general expectations, the fire hazard created by the hurricane of the previous September 21, while present, did not cause any serious fires. The only inconvenience was due to the down timber that in some areas made fishing difficult, and hunting almost impossible, in the favored covers of the sportsmen.

More or less in keeping with conditions found in adjoining states, violations of the fish and game laws seem to be diminishing as time goes on, and is indicative of a better understanding among the sporting element. While no claim is made that the fish and game laws are not still being violated, it is quite apparent that they are not being violated with the reckless abandon that prevailed a few years back.

Acknowledgement is made of the cooperation received in the enforcement of the migratory bird laws, rendered under the supervision of Regional Director S. Barry Locke of the Bureau of Biological Survey of the U. S. Department of the Interior. This cooperation is highly appreciated, and is of inestimable value in the enforcement activities of the Division,—actvities in which the aims of both the State and the Federal authorities are identical. These objectives are year by year becoming better understood, and through continued cooperation the best interests of all should be served.

VIOLATION	Number of Complaints	Disposition				
		Convicted	Discharged, Nolo, and Filed	Appealed	Filed	Fines Imposed
Aliens possessing firearms	5	5	–	–	1	$150
Armistice Day law violation	16	13	3	–	3	125
Assault on an officer	1	1	–	–	–	10
Bass	9	8	1	–	–	105
Carrying rifle in woods during deer week	2	2	–	–	–	40
Deer	9	9	–	4	–	770
Discharge of firearms on State or paved highways	2	2	–	–	–	40
Ducks	13	8	5	–	3	80
Fishing Deerfield River with natural bait	3	3	–	–	3	–
Fishing in ponds on State reservations	3	3	–	–	1	–
Fishing on posted land	15	9	6	–	–	90
Fishing in closed ponds	1	–	1	–	–	–
Fishing other than by angling	24	21	3	1	5	285
Fishing without a license	195	170	25	–	31	1,305
Fishing in breeding areas	3	3	–	–	1	20
Horned pout	1	–	1	–	–	–
Hunting on State property without a permit	2	2	–	–	–	20
Hunting on posted land	6	6	–	–	–	50
Hunting on the Lord's Day	19	16	3	–	4	230
Hunting without a license	32	32	–	2	7	265
Hunting in closed season	7	7	–	1	1	180
Hunting with the aid of a vehicle or power boat	8	8	–	–	4	50
Hunting half hour after sunset	1	1	–	–	–	20
Failure to surrender void license	2	1	1	–	–	–
Refusal to show license	7	6	1	–	4	20
Securing license fraudulently	12	10	2	–	–	105
Mink	1	1	–	–	1	–
Muskrats	3	3	–	–	–	60
Tearing open muskrat house	1	1	–	–	–	50
Netting	1	1	–	–	–	50
Pheasants	13	11	2	–	3	160
Pickerel	36	27	9	–	8	340
Possession of buckshot in deer country	3	1	2	–	–	50
Rabbits	2	2	–	–	–	20
Raccoons	3	2	1	–	–	40
Ruffed grouse	1	1	–	–	–	20
Sale and possession of game for purpose of sale	1	1	–	–	–	50
Shore birds	1	1	–	–	–	20
Snaring or trapping quadrupeds	2	2	–	–	–	100
Squirrels	5	4	1	–	1	60
Taking protected birds	14	13	1	–	1	270
Trapping without a license	17	16	1	1	2	145
Unmarked traps	17	16	1	1	4	215
Trapping without a permit	4	3	1	–	1	45
Setting traps not designed to kill at once	6	6	–	–	–	200
Not visiting traps once in twenty-four hours	12	11	1	2	1	200
Trapping in paths or cart roads	2	2	–	1	1	20
Trapping on posted land	1	1	–	–	–	20
Trapping in closed season	3	3	–	–	1	70
Setting traps within ten feet of muskrat houses	2	2	–	–	1	20
Trout	4	4	–	–	1	30
Unplugged gun for duck hunting	4	4	–	–	2	40
Using dogs during deer week	5	4	1	–	4	–
Violation of regulations	1	1	–	–	–	10
Waterfowl	5	5	–	1	1	95
White perch	6	5	1	–	–	50
Totals	574	500	74	14	101	$6,410

Permits and Registrations

During the fiscal year there were issued 322 game and fur breeders' permits, in addition to those already in force. There are outstanding 173 fish breeders' permits, 64 permits to take protected birds for scientific purposes, and 124 bird banding permits, all in force until revoked. For taking shiners for bait, 108 permits were issued, bringing in a revenue of $540.

New Legislation enacted during 1939

Owing to the fact that a bill for the revision and codification of the fish and game laws, under authority of Chapter 9, Resolves of 1938, was before the legislature of 1939, no new legislation was enacted. House Bill No. 361, which was the department's recommendations, under the above Resolve, for up-to-date fish and game laws in accordance with present-day conservation needs, later became House Bill No. 2213, but failed of passage in the Senate after receiving strong support in the House. Therefore, it is improbable that further changes in the fish and game laws will be made before the next biennial session, at which time it is probable that the same bill, which has been further improved and perfected, will again be submitted for legislative action.

Recommendations for Legislation

In accordance with the explanation given above, in all probability the only recommendations for legislation made to the next session of the Legislature will be a re-submission of the bill proposed by the Department. It is believed that reconsideration will be given it, not only on account of the large amount of work put into its preparation by the Department, but also because of the consideration given it by the legislative Committee on Conservation. The said committee and the sportsmen generally were agreed that this bill, as a whole, comes nearest to giving general satisfaction of any bill brought before it, and is modern enough in its provisions to warrant reconsideration.

Regulations Promulgated by the Division

As required by Section 4, Chapter 499, Acts of 1939, all rules and regulations promulgated by the Division of Fisheries and Game during the fiscal year 1939 are published herewith.

See Appendix for rules and regulations still in effect, promulgated prior to 1939.

August 17, 1939.

Pheasant Regulations for the Season of 1939

In accordance with the provisions of Section 90 of Chapter 131 of the General Laws, I herewith declare an open season on cock pheasants only, from October 20 to November 20 inclusive in all counties, except that in Nantucket County there shall be no open season on that variety of pheasants commonly known as Melanistic Mutant pheasants.

Limit which may be taken by each person—two cock pheasants in one day and six in one season, but no person shall have in possession more pheasants than he can legally take under these regulations.

James E. Agnew
Director of the Division of Fisheries and Game

September 6, 1939.

Migratory Game Bird Regulations for Season of 1939

Pursuant to Section 87, Chapter 131, of the General Laws, I hereby declare an open season on rails and gallinules, Wilson or jacksnipe, coots (mud hens and not that species sometimes called coot), ducks* (except wood duck), geese (except snow geese, swans, and brant) between October 22 and December 5, both dates inclusive, and on woodcock from October 20 to November 19, both dates inclusive.

Daily bag and possession limits on certain migratory game birds: A person may hunt in any one day during the open season prescribed therefor not to exceed the following numbers of migratory game birds, which number shall include all birds taken by any other person who for hire accompanies or assists him in taking such birds; and when so taken they may be possessed in the numbers specified as follows: *Ducks* (except wood duck, but including scoters or sea coots)—10 in the aggregate of all kinds, of which not more than 3 of any one, or more than 3 in the aggregate may be of the following species:— canvasback, redhead, bufflehead, and ruddy; and any person at any one time may possess not more than 20 ducks in the aggregate of all kinds, of which not more than 6 of any one or more than 6 in the aggregate may be of the following species:— canvasback, redhead, bufflehead, and ruddy. *Geese* (except snow geese, swans, and brant)—4 in the aggregate of all kinds, and any person at any one time may possess not more than 8 geese in the aggregate of all kinds. *Rails and gallinules* (except sora and coot)—15 in the aggregate of all kinds, and any person at any one time may possess not more than 15 in the aggregate of all kinds. *Sora*—15, and any person at any one time may possess not more than 15. *Coot* (mud hen, blue Peter)—25, and any person at any one time may possess not more than 25. *Wilson's snipe or jacksnipe*—15, and any person at any one time may possess not more than 15. *Woodcock*—4, and any person at any one time may possess not more than 8.

The above mentioned migratory birds may be hunted every day except Sunday, during the open season from one-half hour before sunrise to one-half hour after sunset with bow and arrow or with a shotgun not larger than 10 gauge, fired from the shoulder; but they shall not be hunted with or by means of any automatic loading or hand operated repeating shotgun capable of holding more than 3 shells, the magazine of which has not been cut off or plugged with a one-piece metal or wooden filler incapable of removal through the loading end thereof, so as to reduce the capacity of said gun to not more than 3 shells at one time in the magazine and chamber combined. They may be hunted during the open season from the land or water, except scoter ducks (between September 15 and October 15), with the aid of a dog and from a blind, boat, or

*Scoter ducks, locally known as sea coots may be taken between September 15 and October 14 inclusive, from hand propelled boats only, on open salt water outside of any enclosed harbor or bay, but not within 300 yards of any bathing, picnic, or residential beaches, or any land except rocks, points, or islands uninhabited. The line of demarcation for enclosed harbors and bays, within which there shall be no hunting of scoters, shall be in general the line of outer beaches on either side of the openings to said harbors and bays, but there shall be no hunting of scoter ducks in the following areas within the points designated herein: **Newburyport Harbor,** inside the jetties at mouth of Merrimac River; **Ipswich River,** inside southern tip of Bar Island Head to Ipswich Light; **Annisquam,** inside Bald Rocks to U. S. Coast Guard Station; **Rockport,** inside breakwater; **Gloucester Harbor,** Eastern Point Light to Normans Woe; **Beverly and Salem Harbor,** Gales Point, Manchester to Marblehead Light; **Lynn Harbor,** Bass Point, Nahant to Point Shirley, Winthrop; **Boston Harbor,** inside Point Shirley to Point Allerton, Hull; **Cohasset Harbor,** inside White Head Point to the outer tip of the Glades; **Duxbury and Plymouth Bays,** inside Gurnet Point to Elisha's Point, Manomet; **Barnstable Harbor,** inside Beach Point to Chase Garden Creek; **Provincetown Harbor,** inside Long Point Light to High Head; **Flats inside upper Monomoy Island,** from Red River to Inward Point; **Lewis Bay,** inside Point Gammon to Jetty, Hyannis Harbor; **Buzzards Bay,** inside Wings Neck Light, Bourne to Birds Island Light, Marion, to Strawberry Point, Mattapoisett, to Rock Point to Sconticut Point, Fairhaven, to Fort Rodman, New Bedford, to Round Hill Point, Dartmouth. The regulation applicable to scoter ducks from September 15 to October 14, inclusive, shall not apply during the period from October 22 to December 5, at which time they may be hunted in the same manner and in the same areas as for other ducks covered in these regulations.

floating craft of any kind, except as hereinafter provided; but migratory game birds are not to be hunted from or by the aid of an automobile, aircraft of any kind, sinkbox (battery), power boat, sail boat, or any boat under sail, any floating craft or device of any kind towed by power boat or sail boat.

No migratory game birds are permitted to be hunted directly or indirectly with or by the aid of corn, wheat, oats, or other grain or products thereof, salt, or any kind of feed by whomsoever, or for whatsoever purpose, placed, deposited, distributed, scattered, or otherwise put out in any environment whatsoever, whereby such migratory game birds or waterfowl are lured, attracted, or enticed to the hunter; but it is not intended to forbid the taking of such birds attracted by standing or growing crops of grain or by harvested grainfields so long as such crops are not manipulated or such fields have not been harvested by man or his agencies so as to cause such grain to be placed, deposited, scattered, or otherwise put out as aforesaid. In the hunting of waterfowl the use, directly, or indirectly, of live duck or goose decoys is not permitted regardless of the distance intervening between any such live decoys and the position of the person or persons hunting them, nor shall anything in these regulations be deemed to permit the use of an aircraft of any kind, power boat, sail boat or other floating craft or device of any kind for the purpose of concentrating, driving, rallying, or stirring up migratory waterfowl and coot.

The migratory birds referred to herein which have been legally taken may be held in possession at any time, in the numbers specified in these regulations, during the open season and for 10 days next succeeding said open season. Migratory game birds lawfully killed during the open season in any other state may be possessed in Massachusetts for a period of 10 days after the close of the season where killed.

The possession limits hereinbefore prescribed shall apply as well to migratory game birds taken in any other state or territory, Canada, Mexico, or other foreign country, and brought into the Commonwealth as to those taken in the Commonwealth, in one calendar week, except that 2 days' bag limit of ducks, geese, brant, and woodcock may be brought into the Commonwealth in one calendar week provided that the name and address of the shipper and of the consignee shall appear on any package in which such birds or parts thereof are transported together with an accurate statement of the numbers and kinds of birds and parts thereof contained therein appearing conspicuously on the outside of said package.

JAMES E. AGNEW
Director, Division of Fisheries and Game

December 13, 1938.

Regulations — Chapter 131, Section 40, General Laws, Ter. Ed.

Having caused **Foster's Pond** in the town of Andover to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Ter. Ed., I hereby close said pond, together with all its tributaries at the point of entry into said pond, to all fishing from:

Dec. 15, 1938 to Apr. 30, 1939, both dates inclusive; and from
Nov. 1, 1939 to Apr. 30, 1940, both dates inclusive; and from
Nov. 1, 1940 to Apr. 30, 1941, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director of Fisheries and Game

December 20, 1938.

Regulations — Chapter 131, Section 40, General Laws, Ter. Ed.

In accordance with the provisions of Chapter 131, Section 40, of the General Laws, Ter. Ed., I have caused **Spectacle Pond** (also known as **Spec Pond** and **Big Spectacle Pond)** in the town of Lancaster to be restocked with fish and I hereby close said pond and its tributaries at the point of entry into said pond to all fishing from:

Jan. 1, 1939 to Apr. 14, 1939, both dates inclusive; and from
Nov. 1, 1939 to Apr. 14, 1940, both dates inclusive; and from
Nov. 1, 1940 to Apr. 14, 1941, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

December 22, 1938.

Regulations — Chapter 131, Section 40, General Laws, Ter. Ed.

In accordance with the provisions of Chapter 131, Section 40, of the General Laws, Ter. Ed., I have caused **Mary's Pond, Snipatuit Pond,** and **Snow's Pond,** in the town of Rochester, to be restocked with fish and I hereby close said ponds and all tributaries to said ponds at the entrance thereof to said ponds to all fishing from:

Jan. 1, 1939 to May 29, 1939, both dates inclusive; and from
Nov. 1, 1939 to May 29, 1940, both dates inclusive; and from
Nov. 1, 1940 to May 29, 1941, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

December 30, 1938.

Regulations — Chapter 131, Section 40, General Laws, Ter. Ed.

In accordance with the provisions of Chapter 131, Section 40, of the General Laws, Ter. Ed., I have caused **Congamond Lakes** in the town of Southwick to be stocked with fish and I hereby close said waters, and all tributaries to said ponds at the entrance thereof to said ponds to all fishing from:

Jan. 1, 1939 to May 29, 1939, both dates inclusive; and from
Nov. 1, 1939 to May 29, 1940, both dates inclusive; and from
Nov. 1, 1940 to May 29, 1941, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

January 19, 1939.

Regulations — Section 40, Chapter 131, General Laws, Ter. Ed.

Having caused **Lake Massapoag** in the town of Sharon to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Ter. Ed.,

I hereby close said pond and its tributaries at the point of entry to said pond to all fishing from:

Feb. 1, 1939 to May 29, 1939, both dates inclusive; and from
Nov. 1, 1939 to May 29, 1940, both dates inclusive; and from
Nov. 1, 1940 to May 29, 1941, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

Nothing in these regulations shall be deemed to affect the regulations of June 26, 1935, closing that part of Lake Massapoag set off by a line running westerly from the end of a point on the northeast corner of South Cove, said corner being on the land of one Dubinsky and intersecting the western shore just south of a duck blind, as a breeding area.

JAMES E. AGNEW
Director of Fisheries and Game

January 19, 1939.

Regulations — Section 40, Chapter 131, General Laws, Ter. Ed.

Having caused **Plainfield Pond** in the town of Plainfield to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Ter. Ed., I hereby close said pond and its tributaries at the point of entry to said pond to all fishing from:

Feb. 1, 1939 to May 29, 1939, both dates inclusive; and from
Nov. 1, 1939 to May 29, 1940, both dates inclusive; and from
Nov. 1, 1940 to May 29, 1941, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

JAMES E. AGNEW
Director of Fisheries and Game

March 31, 1939.

Regulations — Chapter 131, Section 40, General Laws, Ter. Ed.

Having caused **Onota Lake** in the city of Pittsfield to be stocked with fish in accordance with the provisions of Chapter 131, Section 40, of the General Laws, Ter. Ed., I hereby close said pond to all fishing from:

Apr. 1, 1939 to May 29, 1939, both dates inclusive; and from
Nov. 1, 1939 to May 29, 1940, both dates inclusive; and from
Nov. 1, 1940 to May 29, 1941, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

JAMES E. AGNEW
Director, Division of Fisheries and Game

November 1, 1939.

Regulations — Section 40, Chapter 131, General Laws

Having caused **Great Pond** (also called Ashfield Lake) in the town of Ashfield to be restocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Ter. Ed., I hereby further close said pond to all fishing from:

Nov. 1, 1939 to Apr. 30, 1940, both dates inclusive; and from
Nov. 1, 1940 to Apr. 30, 1941, both dates inclusive; and from
Nov. 1, 1941 to Apr. 30, 1942, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

James E. Agnew
Director, Division of Fisheries and Game

November 1, 1939.

Regulations — Section 40, Chapter 131, General Laws, Ter. Ed.

Having caused **Halfway Pond, West Pond** (also known as Great West Pond), and **Billington Sea,** in the town of Plymouth, to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Ter. Ed., I hereby close said ponds to all fishing from:

Dec. 1, 1939 to Apr. 30, 1940, both dates inclusive; and from
Nov. 1, 1940 to Apr. 30, 1941, both dates inclusive; and from
Nov. 1, 1941 to Apr. 30, 1942, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

James E. Agnew
Director, Division of Fisheries and Game

WILD BIRDS AND MAMMALS, AND FRESH-WATER FISH

Game

The work that is being carried on with the aim to improve conditions for both the game and the non-game birds and mammals, is discussed later on in this section under "Projects under the Pittman-Robertson Act," "State Forests," and "Reservations and Sanctuaries."

Migratory Game Birds

Waterfowl.—Ducks and geese show no decrease from last year, and the fair assumption is, from all appearances, that most species of ducks, if not all, are on the increase. Geese have been seen in greater numbers than for several years, and have shown up particularly well on Cape Cod and on the islands of Martha's Vineyard and Nantucket. The fact that certain localities report a scarcity of ducks or geese need not be taken seriously, as conditions govern the movements of both species.

Following the announcement from Washington of the Federal regulations for the shooting of migratory game birds, the Director, as provided by State law, declared on September 6 an open season and regulations for the hunting of migratory birds in Massachusetts. These regulations coincide with the Federal regulations except in respect to the hours of shooting, for it is mandatory by State law that the daily open season shall be set at from one-half hour before sunrise to one-half hour after sunset. Nevertheless, since in all cases the Federal regulations supersede those of the State, the legal hours of shooting were, as provided by the Federal rules, as follows: ducks, geese and coot, 7 A. M. to 4 P. M.; Wilson's snipe or Jacksnipe, woodcock, rails and gallinules, 7 A. M. to sunset. The full text of the State regulations has been given in the section on "Rules and Regulations Promulgated by the Division" just preceding.

Woodcock.—The woodcock season generally did not measure up to expectations, with gunning being spotty. It is quite apparent that the flight did not stop in Massachusetts, and appearances indicate that a heavy Maine flight passed before the Massachusetts season opened.

Upland Game

The hurricane of September 21, 1938, while causing dissatisfaction and general confusion during the 1938 hunting season owing to proclamations closing the woods and deferring the opening of seasons, probably in the long run reacted to the advantage of the sportsmen in that the tangled masses of trees and brush furnished additional cover for wildlife to such an extent that their capture was difficult, thereby leaving more brood stock, which meant a better chance for a larger production of game for the 1939 season.

The effect of this additional protection to wildlife has been borne out particularly in the case of ruffed grouse, which has increased over the available supply of 1938, and a noticeable increase in their numbers is evident throughout the Commonwealth. The additional birds carried over, plus a favorable breeding season in the spring of 1939, has added many grouse to the annual supply and should materially augment the numbers from year to year until the peak is again reached, two or three years hence. The report of grouse observed throughout the summer, and the numbers taken during the 1939 season, has been one of the bright spots for 1939.

Quail were reported generally plentiful prior to the opening of the season in the areas most frequented by them, and the usual numbers were taken by the gunners, with a possibility of a slight decrease.

Pheasants were considerably more in evidence prior to the opening of the season, and in many areas particularly good gunning was enjoyed over that for the past several years; but as usual the cock birds were more difficult to find than were the hens, although a good supply existed throughout the real pheasant range.

Gray squirrels appeared in great numbers generally throughout the State just prior to the opening of the season, but the migration had largely disappeared by the opening day, which caused many to believe that there was a scarcity. The periodical migration of gray squirrels is misleading to many squirrel hunters, for it gives an appearance either of great increase or extreme scarcity. As a matter of fact, the number of squirrels in a given area is no indication of the actual situation with respect to their numbers.

Hares and rabbits were plentiful throughout the entire State, and 1939 should be about the peak year. A decrease in their numbers may be looked for in accordance with the cycle that is about to take its downward swing again.

Raccoons remain about the same, and with woodland conditions as they are, the number taken probably has been reduced somewhat through their ability to escape man and dog. This should react favorably to raccoon hunters in the long run.

Opossum for the first time over a great many years appear in the report, owing to the apparent extension of their range northward; and while it is not the usual thing to take opossum, some are being captured throughout the State, and their numbers are apparently increasing. While it is improbable that they will ever be taken in numbers comparable to the take farther south, mention of them must be made, and in all probability protection for them will be provided in the near future.

Furbearers are still enjoying a certain amount of immunity through the low prices paid for furs, and their numbers should increase correspondingly through the absence of trapping activities.

Beavers are gradually extending their range in Berkshire County. While less has been heard through the year of damage by them to property, it is, in all probability, only a lull in their activities in farming communities, and it is expected that further extension of their operations will eventually bring complaints of damage.

Bounties amounting to $500 were paid on 50 wild cats (lynx) killed during the year. Any fluctuation from year to year in the number of wild cats reported taken is no indication that their numbers are materially increasing or decreasing, and in all probability they may be as numerous as in any other year.

The open season on deer falling within the period of this report was from December 5 to 10, 1938. While the total of deer killed was some 264 less

than during the previous season, there were 2,303 deer reported as taken, which was a large kill considering what appeared to be adverse conditions during that week.

Of the 2,303 reported, 1,253 were bucks and 1,050 were does, with Berkshire County leading all counties with a total kill of 690. The complete schedule of kills by county is as follows: Barnstable, 219; Berkshire, 690; Bristol, 97; Dukes, closed; Essex, 11; Franklin, 417; Hampden, 321; Hampshire, 102; Middlesex, 37; Nantucket, 83; Norfolk, closed; Plymouth, 117; Suffolk, closed; Worcester, 206; locality not stated, 3.

It is worthy of note that from the 1937 to the 1938 season the kills increased as follows: Bristol, from 66 to 97; Franklin, from 375 to 417; Middlesex, from 24 to 37; Nantucket, from 65 to 83; Plymouth, from 68 to 117. Decrease in the kill from that of 1937 is noted as follows: Berkshire, from 935 to 690; Barnstable, from 220 to 219; Essex, from 12 to 11; Hampden, from 396 to 321; Hampshire, from 114 to 102; Worcester, from 289 to 206; with the localities undetermined remaining at 3 in each year.

Deer found damaging crops and shot by land owners (as permitted by law) numbered 41 (none of which were shot on Nantucket).

In addition to the above, 90 deer were accidentally killed as already detailed under "Enforcement of the Game and Inland Fish Laws."

The disbursements during the fiscal year 1939 for the 85 claims for damage to crops by deer totaled: $2,785.96 ($2,434.33 for claims, $304.59 for appraisal fees, and $47.04 for seals). The claims for damages were much smaller than in previous years.

Statistics of Game and Fur-Bearing Animals Taken. — There were 58,279 reports of game and fur taken during the calendar year 1938, filed by purchasers of sporting, hunting and trapping licenses for 1939. Tabulated, they show the amount of game and fur taken in 1938 to have been —

Gallinules	62
Rails	180
Wilson snipe (Jack snipe)	550
Fresh-water coots (mud hens)	1,816
Scoters, commonly known as skunk-head, butter-bill, white-wing and gray coots	13,741
Black ducks	23,363
All other ducks	10,537
Geese	605
Brant (shooting not permitted)	—
Woodcock	8,355
Quail	6,546
Ruffed grouse	19,110
Pheasants	18,608
Deer (bucks, 1,253; does, 1,050)	2,303
Cotton-tail rabbits	100,554
White hares	10,967
Gray squirrels	30,855
Total head of game taken	248,152
Muskrats	39,633
Minks	1,317
Skunks	8,541
Red foxes	4,256
Gray foxes	661
Raccoons	2,186
Weasels	651
Otters	72
Canada lynx (loup cervier)	42
Bay lynx (wild cat or bob cat)	99
Total number of pelts taken	57,458

Projects under the Pittman-Robertson Act

Massachusetts assented to participate in Federal assistance to states under the Pittman-Robertson Act by legislative acceptance (Chapter 392, Acts of 1938). Subsequently, many projects were sponsored and approved, and in the development and operation of these projects the Division of Fisheries and Game was represented by Mr. Joseph A. Hagar, Ornithologist. The following is a brief resume of projects engaged in.

Waterfowl Research Project

This project is a five-year study of our two most important waterfowl—black duck and Canada goose—with particular reference to their numbers and migratory movements through the State, and to develop practical measures for improving their winter environment. An important phase of the project is a complete study of the available banding data on black ducks to determine such questions as the breeding range of our wintering ducks, extent of annual mortality, local movements during the winter, etc. Some 20,000 records have been tabulated to date, and final analysis of the data will soon begin. To supplement banding work carried on by private agencies at Cape Cod for more than ten years, the Division is operating a banding station at Newburyport which trapped 1,300 ducks last winter (many of them more than once), and has a man at Orleans engaged in special problems of winter distribution.

A second phase of the project has to do with the supplementary feeding of whole corn to carry black ducks through critical periods in the winter when their natural food supply is frozen up. This work is strictly experimental, and the results are being carefully checked in many ways. It is being carried on both at Newburyport and Orleans.

The third segment of the project deals with experimental planting of rye and wheat for the use of Canada geese, the wintering population of which in Massachusetts has been very adversely affected by the disappearance of eelgrass. This past fall the Division made plantings on Sampson's Island in Pleasant Bay at Orleans, and at Chilmark on Martha's Vineyard.

State Forest Development Projects

The second type of Pittman-Robertson project in operation during 1939 has been the development of wildlife areas on State Forests. When the Civilian Conservation Corps camps were first established, a number of these areas had been set aside and some environmental improvement carried out. At a few of them the work has continued under Civilian Conservation Corps auspices until the present time, but most of the developments lapsed when camps were discontinued. The Beartown development has been carried on continuously for the longest period of time, and some noteworthy results have been accomplished. Pittman-Robertson funds have made possible the revival of the wildlife development program, under the supervision of Mr. Harold M. Bradbury, Game Culturist, of the Division of Fisheries and Game.

Wrentham Area.—On February 20, development work was started on the Wrentham Area with two graduates of the Stockbridge School Wildlife Course, assisted by National Youth Administration labor. On April 17, one of these graduates was sent to the Daughters of the American Revolution Wildlife Area in Goshen, an undergraduate filling the vacancy so caused at Wrentham. Work proceeded with these two men, plus National Youth Administration labor, until September 23, when the undergraduate returned to school. At the close of the year, work was being carried on by a foreman with National Youth Administration assistance.

Excellent progress has been made, as the following resume will attest: 5,868 feet of fire lanes have been graveled; one wooden log bridge was constructed; 2.5 miles of fire lane were brushed out; 135 "No Trespassing" sign backers and posters were assembled and erected; 24,000 evergreen trees were planted in groups to provide cover; 400 persistent fruit-carrying species were planted

for winter food; one new food patch was cleared and planted to clover, millet and buckwheat, as were 10 previously prepared; 50 acres of cover and food species were released and the slash piled for emergency cover; and 13.5 miles of intersecting cruise lines were surveyed and cleared, and chestnut hub markers set at the intersections.

Daughters of the American Revolution Area, Goshen.—April 17 saw the start of preliminary mapping under the direction of a foreman, assisted by three undergraduates. This required running a 20,800-foot traverse of boundaries and 37,400 feet of type lines run at 400-foot intervals. These lines were marked with paint to clearly define them, thereby definitely locating the data required (cover types, etc.). When this survey was completed, all information so gathered was incorporated in a map showing vegetative types, slopes, ponds, streams and roads. The work plan was drawn up at this time treating of the ecological history, existing conditions, and the proposed development work to be carried on.

Protection was supplied through the construction and placing of 200 signs around boundaries and at all openings. A single strand of twisted galvanized wire was strung four feet above the ground around the boundaries, completely enclosing the refuge. This required the cutting and setting of 375 posts, which were treated with preservative, and 18,500 lineal feet of wire. The weeding of 2,000 feet of fire lane was also completed.

Cover and food assistance was given through the release of an irregular shaped white and red pine plantation covering three acres, and one acre of mixed conifers. Sixty apple trees were released of suppressive vegetation and the dead wood pruned from as many as time would allow. Two clearings were made totaling 1.75 acres, and it is interesting to note that when clearing was commenced, no deer signs were evident, but deer started to browse before the cutting was completed, and have continued to do so ever since. It is of further interest that a careful survey before this cutting was made produced no grouse within one-quarter of a mile, but a pair are now residing there, evidently because of the opening created.

One additional acre was cleared for a food strip planting, and similar feeding and travel was noted here as on the clearings. All brush and slash has been piled in a manner that should provide cover until a natural growth supersedes it; and 23½ cords of hardwood were salvaged. Two hundred fruit-bearing trees, shrubs, and vines, were planted and 60 apple trees released to improve winter feeding conditions.

Development work was temporarily discontinued on August 14, when the Hawley project was started.

Hawley Area.—Work has continued here, with slight interruption, from August 14 until the end of the fiscal year (November 30) under a foreman and three laborers, and has consisted of the following: A complete traverse of boundaries and one wood road a distance of 32,000 feet and 66,732 feet of type line have been run, and mapping is completed. A work plan has been tentatively drawn up, and, subject to final check, will become operative.

Protection to the area has been given by the construction and erection of 225 "No Trespass" posters and 22,000 feet of regulation single-strand wire strung around the boundary, attached to 780 posts cut and treated with preservative on site.

Appenda

On August 12, by legislative action, a Division of Wildlife Research and Management was established. Mr. Joseph A. Hagar, Ornithologist, was designated as Director. Prior to this date the Division of Fisheries and Game had engaged in activities toward the benefit of all wildlife. Representing the Division on this work was Mr. Harold M. Bradbury, Game Culturist. In addition to the field work, these activities included talks to groups of interested persons, and the publication of various articles on the subject.

Development of wildlife habitat apart from Pittman-Robertson projects was carried forward on the various refuges with the assistance of Civilian Conservation Corps forces where available. To increase game species, instruction was given through talks to various civic and sportsman groups as well as by the publication of prepared articles concerning the treatment to be given desirable vegetation. In this way much aid was given to those interested in increasing our wildlife, explaining what to plant in the way of beneficial vegetation, where to plant it and how to treat it. When possible, the Division supplied the necessary stock. Many sportsmen's organizations asked for and received advice and assistance along these lines, and are to be complimented on the results they have obtained.

Development work on the State Forest wildlife areas accomplished the following: 4 water holes were constructed; 29,500 coniferous shelter plantings were made; 3.5 miles of food strips were cleared and planted; 6.7 acres of food patches were prepared and seeded; 2,479 food species were planted or grafted; and 20.25 acres of forest improved by pruning and releasing valuable species that were being killed out by overcrowding. For protection of the areas, single-strand wire fence was repaired and 700 posters were replaced.

Although no mosquito control projects came before the Division of Fisheries and Game this year, 22 Works Progress Administration stream clearance projects, scattered throughout the State, were submitted for inspection and supervision. In all cases the meandering course of a stream was left undisturbed, and the value of slowing down the high water velocity pointed out. It was explained that a maintained water table benefited the land and the vegetation growing thereon, which in turn would result in more and better cover with a consequent increase in wildlife, including fish. It was further pointed out that high velocity water is the direct cause of washouts, and should, therefore, be kept to as near normal flow as possible. To prevent stream bank erosion and to further reduce velocity, plantings of willow cuttings were advised and permission to cut existing vegetation refused. In the smaller streams the construction of low barries or dams about 18 inches high was recommended for the duel purpose of checking run-off and retarding velocity. Where this work has been completed there has been an increase in fish life, mainly of trout, and because of these results the same sound, biological principles will be followed in all future proposals.

Experimental plantings of sago pond weed and widgeon grass were made this year, and it is interesting to note that the widgeon grass planted in the pot holes on Duxbury Marsh has taken hold, resulting in a luxuriant growth despite the high salinity of the water in the low-tide periods during the summer months.

At the Harold Parker State Forest a waterfowl assistance project was undertaken at Bradford, Stearnes and Salem Ponds, as follows: Gently sloping shore banks were cleared of all vegetation to a depth averaging 100 feet from the shore, with an average width of 60 feet. Gravel was placed adjacent to the pond, thereby creating a sunning strip 20-25 feet wide. The remaining lot, approximately 75 feet by 75 feet, was planted to winter rye. Along the shores adjacent to these clearings, buttonbush, blueberry, staghorn sumach, black alder, wild rose, and purple nightshade were planted, and a windbreak of hemlock was established to the north and east. It is interesting to note that immediately upon completion of the first area, waterfowl availed themselves of it and have continued to do so until the ponds were frozen over. The islands in these ponds have also been improved for nesting cover by planting shrubbery and piling cord wood high enough for waterfowl to nest beneath.

Cooperation with Massachusetts State College has continued, students in the wildlife course having visited the wildlife area at Mount Wilcox twice during the year, where much information was acquired by these young men in the practical development of environment.

Owing to the emergency work created by the hurricane, wildlife work as carried on by the Civilian Conservation Corps has been interrupted in all camps

with the exception of Beartown, where work has continued for five years.

Under the terms of the Pittman-Robertson Act, projects are under way at Wrentham, Goshen and Hawley, a full account of which has been given under the heading "Projects under the Pittman-Robertson Act."

Cooperation has been given to the 4-H clubs through guidance in operations combining stream improvement and flood control, as well as in operations for improvement of habitat.

State Forests

Hunting.—Feeling that the permit system for hunting on the State Forests had fulfilled its purpose, and not wishing to place any more barriers in the way of the hunter than are absolutely necessary, the Commissioner of Conservation issued new regulations prior to the opening of the hunting season, which, with a few exceptions, opened all of the forests to shooting without the need of a permit. In addition to the 18 wildlife refuges, which are closed to all hunting under the order which establishes them, the Arthur Warton Swann State Forest in Monterey, the Federation of Women's Clubs State Forest in Petersham, and the Willowdale State Forest in Topsfield and Ipswich, have been closed to hunting in accordance with the request of the donors.

On those areas where Civilian Conservation Corps camps are now operating, special precautions were taken by the federal authorities to protect the enrollees from the danger of stray bullets. Work was carried on in areas least apt to be frequented by the hunters, and posters warning them to be careful were placed around these areas.

During the open season on deer falling within the period of this report (Dec. 5-10, 1938), at which time the permit system was still in effect, the returns showed that 2,244 permits were issued on 9 State Forests and 66 deer were reported killed.

Trapping.—The system which has been in effect for the past few years, whereby one trapping permit could be issued for each 2,500 acres of forest land, was continued during the present year. While requests for permits were not received for every forest, trapping was carried on at 11 of them, and the following table shows the results:

Forest	Mink	Raccoon	Weasel	Red Fox	Gray Fox	Wild Cat	Skunk	Opossum
Beartown	3	7	11	19	7	–	20	2
Chester-Blandford	1	–	2	7	4	–	2	–
Leominster	3	–	–	–	–	–	–	–
October Mountain	–	–	–	8	1	–	–	–
Otis	1	–	–	4	–	2	–	–
Savoy Mountain	5	–	–	1	–	–	2	–
Sandisfield	1	3	8	2	5	–	4	–
Shawme	–	–	–	23	–	–	9	–
Spencer	9	–	3	2	–	–	–	–
Upton	–	–	1	4	–	–	–	–
Willard Brook	4	–	1	–	–	–	2	–
	27	10	26	70	17	2	39	2

Fishing.—The State Forest ponds continued to be popular spots for fishing during the past year, as many, if not more fishermen using them as in previous years.

An order was issued by the Commissioner under date of March 27, regulating fishing on all State Forest ponds and specifying that permits would be required on 15 of them. In variance with the regulations of past years, which did not open the ponds to fishing until May 1, this year's regulations called for opening on April 15, which was the opening date for fishing throughout the State. However, soon after the season started it was found that after May 1 the Civilian Conservation Corps personnel could not be used in connection with the work of issuing permits, and lacking the necessary employees within the

Department, the permit system was cancelled. During the period that the system was in effect (April 15-30) the returns showed that on 9 ponds, 4,579 permits were issued and 3,554 trout were taken, as shown below:

Pond	Forest	Number of Permits	Number of Trout Taken
Dean Dearth Hill Woodman	Brimfield Brimfield Brimfield	2,027	1,741
Fry Berry Sudden	Harold Parker Harold Parker Harold Parker	916	288
Berry	Myles Standish	447	447
North	Savoy Mountain	217	123
Howe	Spencer	972	955
		4,579	3,554

During the year a 24-acre pond was completed by Civilian Conservation Corps forces on the Savoy Mountain State Forest, and, after it has been stocked, should provide excellent fishing. This pond, named Burnett Pond, is located on Gulf Brook, and is at the side of an old mill pond.

No additional streams were set aside as closed feeder streams during the year.

(The report of the fish cultural ponds on certain State Forests will be found in the section on "Propagation of Fish and Game,—Field Work and Field Fish Culture.")

Reservations and Sanctuaries

Boxford Reservation, Boxford.—The regular amount of work was done for the upkeep of this reservation. The Bald Hill Road was again cared for by the town of Boxford; the gypsy and brown-tail moths, eggs and nests were destroyed by the moth superintendent, and poison spray used in the spring. This work is much appreciated by the Division, and especially so by visitors who have suffered from this cause in the past.

Although in the spring of the previous year muskrats were seen, no houses had been observed up to the closing date of the last annual report, November 30, 1938; but in the portion of the winter subsequent to December 1, 1938, the beginning of the present report, their houses were found and it is known that they did winter in the new pond. Wood ducks and black ducks were seen in the spring and early summer, but no young ducks noted. Song and insectivorous birds are increasing in numbers, but it is a very rare thing to find a grouse anywhere in this area.

The trees uprooted by the hurricane near the roads and paths, and which were a fire menace, have been removed at no expense to the Commonwealth. As was the case in other parts of the State, the small rainwater ponds on the reservation dried up completely, and there was no flow from Crooked Pond after the first of June.

Edward Howe Forbush Wildlife Sanctuary, Ashburnham and Ashby.—The construction, started last year, of a three-strand barbed wire fence along the southern boundary of the reservation for the purpose of keeping cattle out, was completed.

Some trimming was done on the trash shrubs along the highway that had obscured the view of the tablet rock; but the fruit-bearing shrubs, like cherry, were left, as they will soon grow sufficiently to allow trimming which will permit a view of the tablet under their lowest limbs.

Of the fancy cedars set at the tablet rock by the donors of this piece of land, only two have survived, and these are not in good condition. As both trees are at one end of the rock, the arrangement is unbalanced. Some of the native

cherries, birch, and poplar, which have started behind the tablet, have been trimmed to encourage them to make a good background. Maples seeded heavily. Willows, birches and other useless shrubs have taken hold in front of the tablet, and if permitted would soon become so thick as to obscure it in a few years. Most of these have been rooted out from a good section in front of the tablet, this being done each year to keep the space open.

Watatic Mountain Wildlife Sanctuary, Ashburnham and Ashby.—This reservation was visited but twice, and was found to be in its usual condition. Practically no work was done except to put up a few additional posters.

Minns Wildlife Sanctuary (Little Wachusett Mountain), Princeton.—On one section of this reservation there are no trees near the boundary line, thus giving no easy opportunity for posting. This summer, a number of sawed oak posts were taken in and set in such areas, and new posters put on with galvanized screws, making replacement easier and without injury to the frames.

Some of the hardwoods blown down by the hurricane have been removed for firewood by Miss Lois Fay (now Mrs. S. S. Powell of Alfred, N. Y.) who holds a life interest in this area. Because of the many nails and spikes driven into the trees for fence purposes adjoining the highways, no one cares to buy that type of wood for fear of injury to their saws.

Isaac Sprague Bird Sanctuary, Carr Island, Salisbury.—The transplanted trees have not done well in this reservation. This condition is due to a considerable measure to continued mouse damage; and though some safeguards have been placed, they are not sufficient for complete control as the mice are very numerous and are found in all sections of the island. Even though they may be killed near the trees, others come in from the outside.

Ram Island, Mattapoisett.—The hurricane and the heavy tide inundated this small refuge to the estimated depth of fourteen feet, spreading the sand over the shore in such a way as to make a wider beach than formerly. The salt killed the few sumachs and other shrubs, as well as the cattails; but the wild grasses and weeds came up as usual. The tide also carried away all the posters, so that new ones had to be reset this year.

The colonies of common and roseate terns increase each year, and this year the nesting appears to be the most nearly perfect for several years past, for a very large percentage of the birds nested, and when the location was visited on July 19, no spoiled eggs were found, very few young had died, and a large number of the young were on the wing. Although some could make but a short flight, they were able to keep at a distance so that they could not be reached.

No damage by owls was noted this season.

Dr. Oliver L. Austin, who has banded common and roseate terns in past years, reports that this year he banded the following: adult common terns, 51; adult roseate terns, 33; young common terns, 883; young roseate terns, 355. He also found that some of the young terns had been banded by some one previous to his arrival.

Knight Wildlife Reservation (Milk Island), Rockport.—This reservation was not visited, nor was Billingsgate Island, Wellfleet, nor the Henry Cabot Lodge Reservation (Egg Rock), in Lynn Harbor. Ram Island, Salisbury, was visited but once. There is little that can be done with these small reservations to increase their usefulness.

Penikese Island Sanctuary, Buzzards Bay.—The greater part of the month of December (1938) was spent cleaning up the rubbish left by the September hurricane and repairing damage resulting from it. The work was continued through the spring. In this work, the 1½ ton Chevrolet dump truck (discarded from the Wilbraham State Game Farm and sent to Penikese) proved very useful.

All the spiles from the bulkhead were pulled down and hauled ashore with the exception of the last row on the outer end, which was left to serve as a marker to prevent any strange boat approaching the island from coming in too close and being wrecked. Additional work had to be done on filling the bulkhead and dropping rocks for a breakwater to save the shore road.

Both skiffs were hauled out twice during the year and painted. Some of the wharf timbers that had come ashore were sawed to the proper lengths and put under the track for ties. A float stage was made of old wharf timbers and chained to the bulkhead, and served in place of a proper landing stage. Although this worked well enough during the summer months, it proved not strong enough to withstand easterly storms, and drives on to the beach in each succeeding gale.

In the dwelling house, a hot air furnace was installed. A plasterboard ceiling was put up in the kitchen, where the plaster fell when the chimney blew down in the hurricane. New window screens for the house were made and painted.

A new 20x20-foot garage was built by a concern from the mainland, and later painted by the caretaker.

A 220-foot trench 4 feet deep was dug, pipes laid, and pressure tank, pump and gasolene engine were installed in the pump house to supply running water for the dwelling; but as the pump house cellar filled with water, pump and engine had to be removed. It was thought this water might be entering from certain old pipes leading from reservoirs and artesian wells, which had been cut off when the leper colony buildings were removed. Accordingly, these old pipes were pent up and filled with dirt, after holes had been dug on three sides of the pump house to drain it. A new sill was put under the pump house and the north side boarded up, using lumber that was washed ashore in the tropical storm. When spring came, a 3½ foot platform, to which the engine and pump were bolted, was built in the pump house.

Last year the garden had been fenced on one side. This year new cedar posts were shipped down, peeled, given two coats of creosote, and a wire fence erected on the three remaining sides of the garden.

In the work of clearing up after the hurricane, over 100 truck loads of rubbish were loaded and dumped over the bank in a heap, and burned on the night of July 4.

The high tide and salt spray killed several of the few surviving pines that had succeeded in taking hold on this island. These were used for firewood.

The terns nested as usual, and at about the same time, although they were two weeks late in arriving at the nesting grounds. The young were reared with few losses and left the island with no unusual incidents.

The herring gulls are each year occupying more land, and have taken over a certain area on the peninsula formerly used by the terns. The gulls, like the terns, had a normal breeding and rearing season.

Penikese Island is the key station in Massachusetts for the U. S. Bureau of Biological Survey in the study and banding of herring gulls and common and roseate terns. On July 3 and 4, Mr. L. B. Fletcher and his party banded 600 young herring gulls, the designation this year being an aluminum, a blue and a green band, all on one leg. This is the third consecutive year of banding the herring gulls. The work with the terns has been under way longer, this being the sixteenth consecutive year. The party banded this year 100 young roseate and 500 young common terns. Many bands from both gulls and terns have been returned to the Bureau of Biological Survey.

During June, Mr. Donald Griffin of the Zoological Laboratory, Harvard University, made studies of the homing instinct of the breeding herring gulls. Birds were captured on the nest, a few feathers by the side of the head marked with paint, and a marker of corresponding color placed beside the nest. The gulls (one from a nest) were taken to various points on the mainland and released. These quickly returned to the nest, and records of the time of return were made by an observer left for that purpose. Gulls liberated as far away as the St. Lawrence River and Lake Champlain returned quickly and without error to the proper nest.

There is little new to note concerning cottontail rabbits. One hundred and ninety-seven were trapped on the island and shipped to the mainland for liberation. As new brood stock, 81 rabbits were shipped to the island, of which 18 failed to survive.

During the fall months, wreckage was hauled and sawed for firewood, and the caretaker has been active in the pursuit of hawks.

Visitors have come to the island in greater numbers, and in larger groups, than ever before, drawn by the reputation of this reservation for producing unusual specimens of marine and bird life. To some, coming from inland places, it is entirely unique.

Reservations under Section 115-120, Chapter 131, General Laws, Ter. Ed.—No additional wildlife sanctuaries were set aside under this statute. The term of the Hinsdale-Peru Reservation expired October 20, 1939, and petition for its renewal has been filed and is awaiting action. The term of the Mattapoisett Wildlife Sanctuary runs until October 1, 1941, and the Ipswich River Wildlife Sanctuary until November 1, 1942.

Inland Fisheries

Contrary to the case in some seasons, the ice fishermen this year (winter of 1938-1939) had ample ice, and as the season advanced the general complaint was too much ice.

The trout season opened, as is becoming more frequently the case, with cold weather and high water, which generally reduced the opening day catch in most sections. Good weather followed, and for a time, trout fishing was better than for some years past. Continued fair weather with no rain caused the streams to drop so that a relatively short season of good fishing resulted. Before the season ended (July 31), streams were so low as to give almost no fishing, with some feeder streams drying up for the first time in a ten-year period. The long-continued dry spell carried over through September, and doubtless many trout were lost. Fall stocking was considerably delayed by a lack of water in streams scheduled to receive fish.

Again permits for the removal of carp and suckers from fishing waters (under supervision of conservation officers) were issued, and authority granted for seining the following waters: Merrimack River, in Lawrence, and from or near the fishway at the dam at Lawrence; Connecticut River and tributaries between Holyoke dam north to the State line; Konkapot (Mill) River, Ashley Falls; Charles River at Mother Brook and Mill Pond near the Needham and Dedham line; sections of the Charles River in Newton, Wellesley, Weston, Needham, Dedham, and at the dam at the line of Newton and Watertown; portions of Lake Quinsigamond, Worcester; Little Spy Pond, Belmont; Big Spy Pond, Arlington; Quannapowitt Lake, Wakefield. Under the above permits approximately 21,625 pounds of carp and 21,390 pounds of suckers were taken.

Public Fishing and Hunting Grounds

For the first time since public fishing grounds were established in Massachusetts in 1932, funds were made available to extend the system to additional streams. The need for this is apparent when it is observed that more and more streams are being closed to the general public each year by individual land owners, or private clubs that obtain control of them.

The Konkapot River, located in the towns of Monterey and New Marlboro in Berkshire County, was selected for leasing, the fact having been established that this stream is an excellent trout fishing stream. During the year agreements have been obtained from the landowners controlling its waters, which will give the Commonwealth an option on acquiring the fishing rights, once it has been established that enough of them are willing to lease. Up to the time this report was written, 7 leases covering 1 1/5 miles of stream, had been actually obtained from the landowners, and it is hoped that, by the time the 1940 trout fishing season opens, all leases for this stream will have been acquired. Due to the fact that many of the landowners along this stream are non-residents, it has been difficult to make the necessary contacts with them, and as a result, a smaller number of leases have been executed up to the present time than would have been the case had they all been local residents.

Preliminary work has also been done on the Nashoba River in Groton, where it is hoped enough landowners controlling the stream will be interested in permitting the Commonwealth to establish public fishing grounds along its shores. At the present time not enough landowners have been contacted to warrant a statement as to how successful the Division might be in this effort.

Special conservation officers were assigned to patrol duty on the streams already under lease to the Commonwealth as public fishing grounds, and, as heretofore, their presence up and down these streams did much to better the feeling between the landowner and the sportsman.

The following table gives the data relative to the public fishing grounds now under the jurisdiction of the Division.

Stream	Town	Miles of stream under lease	Date of expiration of lease
Westfield River:			
East Branch	Huntington, Chesterfield, Cumington	21.0	Mar. 31, 1942
Middle Branch	Huntington, Chester, Worthington, Middlefield	10.5	Mar. 31, 1942
West Branch	Huntington, Chester, Middlefield, Becket	6.5	Mar. 31, 1942
Millers River	Athol, Phillipston, Royalston	5.8	Mar. 31, 1943
Farmington River	Tolland, Otis, Sandisfield	12.0	Mar. 31, 1943
Buck River	Sandisfield		
Clam River	Sandisfield		
Squannacook River	Townsend	9.4	Mar. 31, 1943
Copecut River	Dartmouth, Fall River	8.0	Mar. 31, 1943
Shingle Island River	Dartmouth		
		73.2	

Feeder Streams

No additional feeder streams were closed to fishing this year.

Salmon Restoration

Research work continued on the problem of developing certain coastal streams for the Atlantic salmon. This has been under way since 1937, when, following a conference called to discuss the problem, a "Salmon Restoration Committee" was appointed.

This year, from June 15 to August 31, a survey of streams tributary to the Merrimac River was made for the purpose of determining their suitability for maintaining the Atlantic salmon in a habitat fitted to its mode of living. The survey was continued along the same lines as on the Parker River. Throughout the survey, operations were conducted with a view to possible stream improvements, and where such improvements seemed necessary or advisable, proper recommendations have been made in the discussion of the various streams.

It is obvious that not all streams which joined the Merrimac River are adaptable to the salmon. Where this is the case the facts have been pointed out briefly and proper reasons given for the opinion. The following streams were completed in the present survey: Arch Brook; Argella Brook; Artichoke River; Ayers Village Brook; Bear Hill Brook; Bear Meadow Brook; Bradley Brook; Brandy Brow Brook; Brindle Brook; Cobbler Brook; County Brook; Fitzgerald Brook; Fullerton Brook; Grape Hill Brook; Hawkes Brook; Johnson's Brook; Little River; Lunt's Brook; Massachusetts Brook; Morgan Brook; Nichol Brook; Parsonage Brook; Pikes Bridge Brook; Rushing Brook; Sandy Brook; Sargent's Brook; Sawyer's Brook; Snow Brook; Stanley Brook; Towne Farm Brook; Whittier Brook. A detailed report of each can be found in the Division's stream survey files.

The work completed during this summer's survey must necessarily be followed through to the completion of a survey of the whole Merrimac River System,

and should be confined to those streams which have not already been studied under the trout survey. The magnitude of this program for gaining a fully detailed description of all the streams of the Merrimac River System, warrants the services of a full survey crew if the work is to be completed in a reasonable length of time.

Information in reports that have already been made in the trout survey should be used to the fullest extent, and need only be added to where conditions favorable to salmon differ from those for trout. The conditions for both families being similar would make the salmon survey somewhat simpler, and would, in addition, provide a check on the trout work already accomplished. The principal need is for cleaning up the pollution in the river and its tributaries before any large-scale program can be put into operation. This would necessitate cooperation from the State of New Hampshire through which a large part of the Merrimac River flows. The Massachusetts Department of Public Health has already completed a survey of the sources of pollution of that section of the Merrimac River Valley which lies in this State.

Finally, as to the advisability of considering the Merrimac River in a salmon restoration program, the great part that the river has played as a salmon stream in the early days, and the successful attempts to stock the river during the closing years of the nineteenth century by the Commissioners on Inland Fisheries and Game, which failed when stocking was discontinued, are sufficient indication of the success which might be experienced if a program is inaugurated.

During the year, with the help of members of the National Youth Administration, a research project on Atlantic salmon was instituted. Its purpose was to determine the effect of environment on the shape and condition of salmon parr, and to compare hatchery fish with the same stock in its native river. This information may have a bearing upon whether hatchery parr, when planted in a river, will acquire the particular characteristics necessary to warrant their return as adult salmon to that river. The methods of work consisted of contour measurements of parr to determine the form and appearance as well as weights. A comparison was made of parr native to York River, Gaspe, Canada, and parr raised at a hatchery from York River eggs. This project has not been completed, but it has shown that native parr have a different contour than do hatchery parr. The environment of the parr determines, to a large extent, the morphological characteristics.

In October, the Atlantic salmon reared at the East Sandwich State Fish Hatchery (85,939 fingerlings of the 1939 hatch, and 13,357 two-year-olds, were marked as described below, and allotted for planting, as follows: For planting, in 1940, in the Parker River in Essex County, 6,000 of the two-year-old salmon and 43,102 of the fingerlings (marked by clipping the adipose and the right ventral fins); for planting, in 1940, in the North River in Plymouth County, 7,357 of the two-year-old salmon and 42,837 of the fingerlings (marked by clipping the dorsal and the left ventral fins).

Great Ponds Stocked and Closed, and Breeding Areas set aside

Within the period of this report (Dec. 1, 1938 to Nov. 30, 1939) the following-named great ponds were stocked under Section 40, Chapter 131, G. L., Ter. Ed., and regulations applied by the Director closing the respective ponds to fishing for the periods stated, with penalty of twenty dollars for each violation of the regulations.

For regulations promulgated in prior years and still in effect, see Appendix.

Body of Water	Town	Regulations effective, both dates inclusive—
Foster's Pond	Andover	Dec. 15, 1938 to Apr. 30, 1939 Nov. 1, 1939 to Apr. 30, 1940 Nov. 1, 1940 to Apr. 30, 1941
Congamond Lakes, and all tributaries to said ponds at the entrance thereof to said ponds	Southwick	Jan. 1, 1939 to May 29, 1939 Nov. 1, 1939 to May 29, 1940 Nov. 1, 1940 to May 29, 1941
Mary's Pond	Rochester and Marion	Jan. 1, 1939 to May 29, 1939 Nov. 1, 1939 to May 29, 1940 Nov. 1, 1940 to May 29, 1941
Massapoag Pond	Sharon	Feb. 1, 1939 to May 29, 1939 Nov. 1, 1939 to May 29, 1940 Nov. 1, 1940 to May 29, 1941
Onota Lake	Pittsfield	Apr. 1, 1939 to May 29, 1939 Nov. 1, 1939 to May 29, 1940 Nov. 1, 1940 to May 29, 1941
Plainfield Pond	Plainfield	Feb. 1, 1939 to May 29, 1939 Nov. 1, 1939 to May 29, 1940 Nov. 1, 1940 to May 29, 1941
Snippatuit Pond	Rochester	Jan. 1, 1939 to May 29, 1939 Nov. 1, 1939 to May 29, 1940 Nov. 1, 1940 to May 29, 1941
Snow's Pond	Rochester	Jan. 1, 1939 to May 29, 1939 Nov. 1, 1939 to May 29, 1940 Nov. 1, 1940 to May 29, 1941
Spectacle Pond (also called Spec or Big Spectacle Pond), together with its tributaries at the point of entry into said pond	Lancaster	Jan. 1, 1939 to Apr. 14, 1939 Nov. 1, 1939 to Apr. 14, 1940 Nov. 1, 1940 to Apr. 14, 1941
Great Pond (also called Ashfield Lake)	Ashfield	Nov. 1, 1939 to Apr. 30, 1940 Nov. 1, 1940 to Apr. 30, 1941 Nov. 1, 1941 to Apr. 30, 1942
Half-way Pond	Plymouth	Dec. 1, 1939 to Apr. 30, 1940 Nov. 1, 1940 to Apr. 30, 1941 Nov. 1, 1941 to Apr. 30, 1942
West Pond (also known as Great West Pond)	Plymouth	Dec. 1, 1939 to Apr. 30, 1940 Nov. 1, 1940 to Apr. 30, 1941 Nov. 1, 1941 to Apr. 30, 1942
Billington Sea	Plymouth	Dec. 1, 1939 to Apr. 30, 1940 Nov. 1, 1940 to Apr. 30, 1941 Nov. 1, 1941 to Apr. 30, 1942

No breeding areas were set aside in any great pond during the period of this report.

Fishway and Stream Improvement

The usual program of fishway inspection and repair was continued, and, within the limit of funds provided, improvements were made in design and construction as well as the clearance of obstructions in streams leading to and from them.

The following fishways and stream-approaches were given major attention and adjustments made in those fishways completed during the latter part of the previous year: Saugus River, Fishway No. 1, Saugus; Jones River, Fishways Nos. 1, 2, 3, and 4, Kingston; Red Brook, Pocasset; Parker River, Fishways Nos. 1 to 5, Newbury; First Herring Brook, Fishways Nos. 1 and 2, Scituate; Weir River, Fishways Nos. 1 and 2, Hingham; clearance of obstructions in streams leading into Long Pond and Wequaquet Pond in Barnstable.

Surveys were made and designs prepared for fishways in the Connecticut River at South Hadley and Turners Falls; in the Nemasket River at Middleboro, Obstructions Nos. 1, 2 and 3; and in the Mill River, Rowley.

With reference to the fishway over the dam between Holyoke and South Hadley in the Connecticut River final conferences were held and preparations were made for the purpose of ordering the Holyoke Water Power Company to construct a fishway at South Hadley between the first of April and the first of October in 1940.

Special attention was given to the examination of the canals in the numerous cranberry bogs in the southern part of the State for the purpose of preparing a simple and economical sluiceway type of fishway universally adaptable. Instructions were also given to the foremen of these bogs as to methods of properly screening the canals so as to avoid the trapping of numerous alewives when ascending the streams or returning to the sea.

In order to improve the stock of alewives in various streams in respect to size, length of runs and abundance, the following transfers were made of spawn fish during the month of May. From the Herring Fishery at Pembroke fish were taken to Tack Factory Pond, Scituate; Island Creek Pond, Duxbury; Russell's Pond, Kingston and Crossman's Pond, Kingston. From East Weymouth alewives were taken to Tack Factory Pond in Scituate and Headwater Ponds of Bournedale Herring Brook in Bourne.

The cost of construction work on fishways was lessened and the efficiency of this unit increased through the purchase of a beach wagon and an additional supply of tools.

PROPAGATION OF FISH AND GAME

General

Planting of Eyed Brook Trout Eggs

During the winter it was decided to inaugurate an egg-planting program which might be considered in the light of a continuation of a similar program begun almost twenty years ago. Such an egg-planting project should normally have a period of planting and preparation which was not possible, considering the late date at which it was decided to engage in such a project. The preliminary work of locating and preparing springs must be planned for and carried out in order to make the best use of the eggs and the time spent in planting them. The project engaged in this year might be considered as the first step in collecting the necessary data to obtain the best results for future work along this line.

The type of stream most suitable for egg-planting is the springfed headwater or feeder stream to a good trout system where springs with a well-defined flow will hatch the eggs and feed the fry into good growing water as food and space is required. Not all streams should be considered. Some have the necessary conditions for hatching and growing fry, but do not flow into good trout water. Others have such good conditions for the natural production of fry, with springs flowing out of gravel, which enables them to produce naturally to capacity. In such cases the eggs planted would produce fry but these would suffer from competition and cannibalism among the native fry.

The work is of greatest value on streams that lack gravel, or because the gravel, deeply covered with muck, does not produce native fry. By locating such streams and developing the opportunities on them, a large mileage of present unproductive trout nursery water can be brought into use. Egg planting is one of the earliest activities in fish culture as a means of stocking inaccessible streams when fish culture has made possible a supply of eggs for the purpose. It has been practiced to a greater extent in Europe than on this continent, and from what has been published concerning the stocking of inaccessible Highland streams in Scotland, the term "ridd" has been adopted to designate the artificial nest for the eggs. Almost any device that will keep eggs safely, without requiring attention, and allow the fry to escape into the streams, will suffice, but the most approved and successful type is an enclosed and covered bed of screened gravel where the eggs and fry are safe from animals, but from which they can

escape when ready to feed and scatter down the stream as they feel the need to find room and food for growth.

Where there is not the time or opportunity to prepare for the work, nests other than the enclosed gravel can be used. These include hatching trays, wire baskets, natural moss beds or pebble heaps, which in all cases, should be placed where the hatching will be accomplished by a flow of spring water with as little change in temperature as possible.

The permanent "ridd" or nest should be constructed with sides of lumber and a bottom of gravel, covered so as to exclude animals and to provide semi-darkness, and screened to keep out fingerling brook trout or brook minnows, while at the same time permitting the fry to escape freely. In size the "ridd" or nest might cover an area of from two to over six square feet, and when covered to exclude light, the fry will scatter and hide in the gravel rather than crowd in the dark corners. They will swim out and scatter in the stream as they require food. The one disadvantage in working with it is, that in some localities material must be carried great distances from lines of transportation. The disadvantage with any other method is, that fry escape while in the sac stage and when they are helpless if exposed, and are more subject to accidental loss in floods or with other changes in conditions. It is important to avoid springs or streams subject to floods and to avoid areas where the fry might sink into soft silt and smother.

Although this program was started at rather a late date, it is anticipated that during 1940 the program will be carried out on a much greater basis with the planting of many more eggs. It is to be borne in mind that this program is entirely in supplement to the present hatchery production program, and in no way takes away from this activity. By this additional activity of the Division it is hoped that better trout fishing will be the result.

In the plantings this year, the procedure was as follows: Four sticks were driven into the bottom of the spring or brook, the hatching tray, loaded with eggs, set on the sticks about two inches below the surface of the water, and placed so that there would be always a slight circulation of water through the eggs. The eggs were covered with sphagnum moss, and, finally, the entire tray covered with pine boughs.

The first lot of eggs, totaling 5,648, was planted on February 21 in spring holes at the headwaters of Indian Head Stream in the town of Hanson. The conditions found were as follows: coarse gravel bottom; isolated spring hole off the main feeder; slight flow; water temperature, 45 degrees F.

The second lot, totaling 5,648 eggs, was placed in a feeder stream to Indian Head Stream in the town of Hanson. Conditions varied somewhat from the previous planting, as the eggs were placed in locations where some losses might be expected from flood or large trout. The temperature of the water was 40 degrees F.; the bottom of coarse gravel.

The third planting, of 5,648 eggs, was made in the headwaters of Gorham Brook in the town of Pembroke. Conditions here are similar to the previous plantings, except that the danger of high water is greater, and at this location, a tray so constructed that the trout eggs could not wash off would be advisable.

On Februray 22, there were planted in the headwaters of Minto Brook, a feeder stream to the Bungay River in the town of North Attleboro, 16,944 brook trout eggs. The conditions found here were as follows: bottom, gravel; water temperature, 41 to 46 degrees F. There is a slight danger in this location, of loss of eggs due to a sudden rise of water.

On February 23 there were planted 5,648 brook trout eggs in the spring holes at the head waters of the Unquentenarsett Brook in the town of Groton. The conditions here were as follows: water temperature, 40 degrees F.; isolated spring hole; bottom of fine gravel.

In the afternoon of the same day, 5,648 brook trout eggs were planted in feeder streams to the Nashoba Brook in the town of Westford. In this location the water temperature was quite cold, running as low as 34 degrees F., and the bottom was of coarse gravel. There is likely to be a loss of eggs in this feeder stream if a slight flood should occur.

On February 25, a planting of 5,648 brook trout eggs was made in Slab Brook, in the town of Southwick. The water here was 33 degrees F.; the flow was quite rapid; and the bottom of fine gravel. In this brook there is danger of a loss of eggs from flood or rapid rise of the water.

On February 26, a planting of 16,944 brook trout eggs was placed in spring holes in the Beaver Hole Brook in the town of Sharon. Here the water temperature varied from 40 to 44 degrees F. In some cases the eggs were planted in spring holes over a bed of green vegetation. In other cases the bottom was of fine or coarse gravel.

February 28 there were 5,648 brook trout eggs planted in spring holes of the Unquentenarsett Brook in the town of Groton. This brook has received a fairly heavy stocking of brook trout eggs. However, it is a large brook, over four miles in length, and will quite easily accommodate the expected hatch of trout. Conditions were similar to the previous planting of February 23.

A second planting, of 5,648 brook trout eggs, was made in a feeder stream to Vine Brook, a branch of the Nashoba Brook in the town of Westford. To alleviate the danger of eggs washing off the tray in high water another tray was placed over the top of the first tray. The water temperature was 35 degrees F.; the bottom, coarse gravel. Upon returning to this location on March 4, about 25 percent of the eggs had hatched and were lying in the coarse gravel bottom.

On March 1 there were 2,824 brook trout eggs planted in a large spring hole on the Ironstone Brook in the town of Millville. This was one of the most excellent of all spring holes. The water temperature was 50 degrees F.; the bottom, coarse gravel.

In the afternoon 11,296 brook trout eggs were planted in Cold Brook in the town of Rehoboth. These eggs were planted in the eddies in the main brook. The water temperature was 30 degrees F.; the bottom in one place gravel and another muck; and the flow, medium. At this location losses are apt to occur from two causes: sudden rise of water, and predatory fish. A second planting, of 8,472 eggs, was made in a spring feeder at the headwaters of Lewin Brook in the town of Swansea. Water temperature was 44 degrees F.; the bottom, gravel.

Observations were made as to the hatching success of eggs planted in the various spring holes and feeder streams, and it was found that practically all eggs so planted were fertile and hatched. Other observations were made at a still later date, and it was found that after development of the sac stage the fry moved into the streams.

Fish Hatcheries and Game Farms

This year has been one full of activity and progress at the State fish hatcheries and game farms. At many of the stations the work was greatly increased due to the severe storm in the form of hurricane, flood and tidal wave which swept over much of the State, and which did considerable damage to a number of the hatcheries and game farms. In addition to the regular work carried on throughout the year, the culturists were handicapped by the extra burden of supervising the cleaning up of the thousands of trees which were felled, as well as the repairs to buildings and equipment, a great deal of which had been either completely demolished or damaged to the extent of necessitating replacement.

Throughout the year, monthly visits were made to all game farms and fish hatcheries by Mr. J. Arthur Kitson, Biologist. In so doing, the Division was at all times informed of general activities and conditions. Current operating expenses were discussed with the culturists, inspection of stocks made, and various projects supervised.

A number of Federal projects (see station reports for details) have been in progress during the year at several of the stations. The pheasant wintering pens, erected at all the farms with the assistance of the Works Progress Administration, were used in their entirety for the first time during the winter of

1938-9. At the time of writing this report there are in these pens more than 10,000 pheasants, to be liberated in the spring of 1940.

The Division wishes to acknowledge the excellent work accomplished at the stations by groups of young men assigned to the Division by the National Youth Administration. The culturists, under whose direction they work, are high in their praise of these young men. In addition to actual construction work, a great deal of assistance was received from them on such work as cleaning houses and grounds, care of garden crops, care of birds and fish, spading pens, road work, mowing brush, painting, repairing of pens, and similar general work.

The salvage of lumber from abandoned Civilian Conservation Corps camps was continued during the early part of the year at the Granville State Forest, and the following quantities of lumber were made available to carry on Works Progress Administration projects at the stations: 19,560 board feet of 2 x 4 fir; 26,470 roofers, N. C. pine; 9,506 board feet of 2 x 6 fir; 750 square feet of wall board; 4 doors, 24 windows. The salvage of this lumber was accomplished through National Youth Administration labor, supervised by a member of the staff of this Division. The work was completed on July 8, the grounds cleaned up, and, so far as can be ascertained, there are no other camps in which lumber is available for salvage.

All trout eggs stripped at the hatcheries were disinfected by immersing in acriflavin, as were all trout and salmon eggs brought into the hatchery from commercial and government hatcheries. Sterilization of all pools and ponds with chlorinated water under pressure was again employed at all hatcheries, with the usual excellent results.

The Division continues to propagate the pure Chinese pheasant (*Phasianus torquatus*) at all of the State game farms, and has now established at each one an excellent brood stock of strong, healthy, virile birds.

East Sandwich State Fish Hatchery — Alfred C. Fish, Fish Culturist, in Charge

New Construction and Replacement. — In 1938 a Works Progress Administration project was submitted and all work completed excepting the grading, driving 16 wells, and digging a ditch at the location of the so-called rainbow trout pools. This work was completed in the early part of the 1939 fiscal year, and the pools are in operation. The construction of this new unit will permit rearing approximately 40,000 adult rainbow trout.

Immediately following this project, another one was submitted and approved for a new workshop, ice box, and tearing out the old plank pool series and replacing with concrete. Due to lack of available Works Progress Administration labor, the only work carried to completion was that on the plank pool series. This will provide 3 pools 50 feet by 7 feet, with sides, ends and flumes of concrete.

With State funds (in order to provide a supply of the warmer pond water for the Atlantic salmon) 150 feet of 6-inch galvanized steel pipe was laid at the heads of the pool series, and from this, 2-inch steel pipe carried the water to the pools. This system was connected to the old pipe from Nye Pond at the concrete box.

Poultry wire was placed over the pools containing the Atlantic salmon to prevent loss by predatory birds. Twenty temporary shade boards were placed over the rainbow trout pools in an effort to keep the water temperatures down and to give the fish cover. Seven electric light poles were erected and wired, which will provide electricity for the sterilizing pump at the rainbow trout pools.

New Equipment. — No new equipment was acquired this year.

Brook Trout. — For the work of the year, eggs were collected from the brood stock at this station. During the year, 101,644 eggs were distributed for experimental planting in public waters, and 3,731 yearlings and 997 adults were planted in waters open to the general public for fishing. In addition to

these, 100,000 brook trout eggs were transferred to the Sunderland State Fish Hatchery and 140,000 fry were transferred to the Palmer station.

At the close of the year, there are 438 adult brook trout on hand at this station, but no fingerlings, since all the fry were transferred to Palmer as stated above.

Rainbow Trout. — During the year, 10,200 yearlings were planted in open waters. From the Sandwich State Fish Hatchery, 21,000 fingerlings were received in January and at the same time 16,000 fingerlings were received from the Montague State Fish Hatchery.

At the close of the year, there are 1,061 adult and 35,509 yearling rainbow trout on hand.

Atlantic Salmon. — In February, 150,000 Atlantic salmon eggs were received from the Dominion Government of Canada in exchange for brook trout eggs.

No salmon were distributed to open waters during the year, but 500 of the 1938-hatched salmon were used in connection with an experimental research problem. (See "Salmon Restoration" under "Inland Fisheries.")

At the close of the year there are on hand 85,639 fingerling salmon and 13,357 yearlings.

Montague State Fish Hatchery — Ralph Bitzer, Fish Culturist, in Charge

New Construction and Replacement. — The works Progress Administration project approved in 1938 and on which work was started in April of that year, was nearly completed, but a small portion of the work had to be carried over into 1939. This was completed early in the year.

Following that, the project submitted in August and approved in October of 1938, was taken up. As a result of this project, there were completed and are in use 9 additional rearing ponds with board sides and cement dams. One large dam and two cement headers with underground tile were constructed in the lower section, these three being replacements. There were 125 large pine trees planted about these ponds.

A new stripping house 20 feet by 22 feet was erected with cement foundation and with floor and drains connected. A new hatch house with office and toilet was constructed, 20 feet by 38 feet and one story high. Owing to limited carpenter labor, only the outside framework of the buildings could be completed. Chimneys were built in both buildings, and 42 feet of 15-inch tile was used in the foundation to take care of the brook. Four hundred and fifty feet of 4-inch galvanized water pipe was laid to supply the new hatch house.

The old loading stand was removed and cement piers constructed ready for tops. There were 14 double and 3 single hatching troughs made, with metal dams and covers. A new feed trough was made for the new hatch house and stripping house, as were 3 holding tanks for the latter.

The lawns at the residence were dug up, sand removed to permit a clay base followed by loam on top. Some shrubbery, and two trees, were planted around the house. This project will be completed in the next fiscal year.

Storm damage work was started in April with a crew of men to excavate and lay 250 feet of concrete pipe to take care of future flood waters entering one section of ponds. Considerable stone was used in walling up to hold the banks, and a section of this stone work was later cemented to keep it intact. The completion of this work will add greatly to the safety of that section of the hatchery system.

With State funds the kitchen at the culturist's residence was remodeled and painted; likewise the office room was painted.

New Equipment. — A 1½ ton Chevrolet truck was purchased, turning in the 1½ ton 1930 Ford. A single-wheel sickle bar type grass cutter was bought, which will be of value in keeping the grounds in trim.

General. — During the summer a feeding experiment was carried on at this hatchery using a prepared commercial food which had been used successfully

in other states. One pool at the intake of the system, in which fingerling brook trout had been placed, was used, and the experiment was conducted throughout the summer along with a control pond below. The mortality was normal, but the growth made by these fish was considerably less than in the fingerlings in the hatchery which had been fed the regular diet.

In the new meat house, a dry-food storage bin with a conveyor unit was designed and constructed, and proved very satisfactory. A revolving, enclosed food chart was designed and placed under glass at the food-mixing bench, and will make for convenience and accuracy in mixing.

The spring distribution of trout started the first of March and was completed in April. Two trucks were used continuously.

Bug lights were again in operation in all the trout pools from May to September. The extreme drouth conditions seemed to produce a greater number of insects than usual, which provided an extra supply of natural food for the trout.

Brook Trout. — Spawning of parent fish continued into December and more eggs than usual were taken to insure sufficient fry for filling all ponds. An abnormal number of brook trout eggs was lost in the eyeing stage, but those that did hatch were strong and vigorous and progressed well.

For the fall of 1939 stripping, 12 brook trout yearlings were donated to this hatchery by the Plymouth Rock Trout Company of Plymouth, Mass.

For the work of the year, eggs were collected from the station brood stock. During the year, the following distributions were made to open waters: 151,662 fingerlings (2,170 of which were the previous year's hatch); 58,605 yearlings (7,180 of the 1937-hatched and 51,425 of the 1938-hatched fish); and 745 adults. In addition, 3 fingerlings, 16 yearlings and 3 adults were distributed for display purposes.

At the close of the year there are on hand 72,305 fingerlings, 11,467 yearlings, and 843 adults.

Rainbow Trout. — The stripping of eggs extended well into January, after which the station was filled to capacity. A consignment of 50,000 eyed rainbow trout eggs was received from the United States Bureau of Fisheries Station at White Sulphur Springs, West Virginia, which proved to be a very poor lot of eggs with very few fry hatching. There was an unusually large number of rainbow trout eggs lost in the eyeing stage, but after hatching, those that did survive came along well.

Distributions during the year were: To open waters, 25,000 fingerlings (1939-hatch); 49,551 yearlings (34,015 of the 1937-hatch and 15,536 of the 1938-hatch); and 2,935 adults. To rearing pools, 18,000 yearlings. For display and study, 12 yearlings and 42 adults. To the Palmer State Fish Hatchery, 35,000 yearlings; to the Sutton Hatchery, 10,000 fingerlings (1938-hatch); to the East Sandwich State Fish Hatchery, 16,000 fingerlings (1938-hatch); and to the Sandwich Hatchery, 25,000 eggs.

At the close of the year there are on hand 116,000 fingerlings, 49,252 yearlings, and 1,177 adults.

Palmer State Fish Hatchery — William F. Monroe, Fish Culturist, in Charge

New Construction and Replacement. — A Works Progress Administration project was started on February 15, which consisted of the construction of three additional bass ponds; boarding up all daphnia pools and constructing three more series; increasing the height of the dikes of several bass ponds; laying pipe between ponds; boarding up trout pools above the road and placing concrete dams at the outlets; boarding up trout pool below the State road; laying a dry fieldstone wall along the lower end of the brook; and painting the hatchery building, garage, culturist's house and combination ice and meat building. Work on this project is not completed as the fiscal year closes, and it will continue well into the coming year.

With labor supplied by National Youth Administration, during the winter a considerable number of fallen trees from the hurricane were cleaned up and brush burned.

With the aid of young men from the same source, the dikes of many bass ponds were put in shape so that they could be mowed with a machine. This adds greatly to the appearance of the ponds and of the place in general. Also assistance was given by these men in resurfacing a large part of the driveways, besides doing considerable mowing of grass and weeds around the hatchery grounds.

In the fall, after the bass fingerlings had been shipped, some of the bass ponds were partly cleaned, and all connecting pipes were cleaned out with a steel brush, greatly increasing the flow of water to these ponds. Some of the race-way covers and walks were replaced, or repaired with new lumber. A needed parking space at the trout section was excavated and filled in with gravel. Also a wooden trough drain from the meat room was installed, and water connected to the meat room. This work was done by the station crew, assisted by National Youth Administration labor. These young men also helped considerably in the general work of the station.

On February 10 a group of men was assigned to the station on storm damage work. This work came to a close July 25. It consisted of reboarding and re-wiring two trout pools that had badly caved in and washed by the flood waters. Also the mud and silt had to be removed from the bottoms, and the pools re-graveled.

The hatchery building and combination meat and ice building were reshingled. These same buildings, together with the culturist's house and garage, were painted, but the labor for painting was by Works Progress Administration men.

A new road bridge (14 feet by 12 feet) at the trout section, was built to take the place of the old one destroyed by the flood.

Sections of the dry stone walls at the bass section had to be rebuilt, and consisted of relaying the stone where it had caved in to the brook due to the brook overflowing the stone wall, and also causing the wall to be undermined in sections.

The largest job was the fallen trees. There were thousands, and considerable time was put into this work—trimming the trees, burning brush, hand-sawing the logs into movable lengths, hauling them out to the mill, etc., and finally sawing them into lumber.

In the previous year, and immediately after the storm, repairs were made on the roofs of the three houses, and the garage, as well as the replacing of glass in windows and repairing chimneys.

No new construction was done with State funds,—only general repair and replacement work.

A number of pine trees, from the station's own stock, were transplanted around the pools at the trout section by the National Youth Administration labor.

New Equipment. — A new Chevrolet 1½ ton stake truck with a hydraulic dump was purchased, the old 1933 truck being kept for general use on the place. A 500-gallon gasoline tank with pump was purchased and installed; and a new power lawn mower was added to the station equipment.

Brook Trout. — For the work of the year, eggs were collected from the brood stock at the station. To the fry hatched were added 140,000 fry received from the East Sandwich State Fish Hatchery. During the year, 30,000 fry were transferred to the Sutton State Fish Hatchery. There were planted in open waters: 119,500 fry; 17,500 fingerlings of this year's hatch (of which 2,500 averaged 6 to 8 inches in length); 40,200 yearlings (2,350 of the 1937-hatched and 37,850 of the 1938-hatched stock); and 525 adults. In addition, 2,500 yearlings were supplied to rearing pools.

At the close of the year there are on hand 63,192 fingerlings, 4,995 yearlings, and 933 adults.

On October 3, an experimental lot of 18,000 eyed brook trout eggs was received from a commercial hatchery. These eggs were stripped from fish

whose spawning time, by the use of artificial light, had been advanced to September 1 (2½ months earlier than the station's brook trout). The temperature of the water at the Palmer hatchery slowly drops after the first of November to about 35 degrees F., and consequently makes hatching a long, slow process with high mortality. All of these eggs hatched by October 21, with few losses, and the hatching was completed before the water had cooled to its winter temperature. It is expected that the fry from these purchased eggs should get a good start when the water warms up next spring, and thus make a faster growth than fry hatched under normal conditions at this hatchery.

Brown Trout. —From this station there were 24,425 adult brown trout distributed to open waters. In October, 35,000 yearlings were received from the Sunderland State Fish Hatchery (for wintering in bass ponds), and are on hand November 30.

Rainbow Trout. — There were distributed from this station 24,824 adult rainbow trout. In October, 35,000 yearlings were transferred to this station from the Montague State Fish Hatchery (for wintering in bass ponds), and are on hand November 30.

Use of Bass Ponds for wintering Rainbow and Brown Trout. — In the fall, the 70,000 yearling rainbow and brown trout referred to above were transferred from the Sunderland and Montague stations to be reared in the bass ponds at Palmer, and made unusual growth. Bass ponds were first used experimentally to determine whether or not it would be possible to hold over for spring distribution a considerable number of trout which heretofore have been distributed in the fall. During the winter of 1938-9, there were 50,000 brown and rainbow trout carried over in these ponds and liberated in the spring of 1939, having made a growth of 2-4 inches. There was less than 2 percent mortality, and all fish came through the winter in excellent condition. Because of these fine results, it has been decided to increase the annual carry-over by 20,000 fish.

Small-mouth Black Bass. — No artificial feeding of bass was undertaken this season. A sufficient amount of daphnia was supplied on the hatchery grounds for food for both fry and fingerlings. The boarding of some of the daphnia pools was begun as a Works Progress Administration project which aided materially in increasing the supply of this natural food to a sufficient quantity to be used for feeding throughout the season.

From various sources, including the Merrill State Pond System and salvage operations, 543 breeders were received, of which 373 are on hand November 30. From the bass ponds, 64,450 fingerlings were distributed to public waters, the fingerling production having been increased considerably over other years. Approximately 11,000 bass per acre were produced.

Sandwich State Fish Hatchery — Irving Lewis, Fish Culturist, in Charge.

New Construction and Replacement. — With the assistance of National Youth Administration young men, the following construction was completed: Five of the old wooden dams that had badly rotted away, were replaced with new wooden dams. The portable garage was torn down and in its place a storehouse 20 feet by 30 feet was erected. Forty arbor-vitae and Scotch pine trees were transplanted from the back of the hatchery grounds to an area along the middle section of the pools. A drainage ditch 800 feet long was cleaned out.

A Works Progress Administration project was submitted in the latter part of 1939 for the construction of a rest room, 8 new pools, transplanting of several trees, laying of a 30-foot concrete tile, and the repair of the existing concrete pools. This was approved, but, due to the lack of available labor, it was impossible to start any of the work.

New Equipment. — No new equipment was bought for this station.

Brook Trout. — For the work of the year, eggs were collected from the station brood stock, and 50,000 of the fry hatched were transferred to the

Sutton State Fish Hatchery. Early in the year 10,000 fingerlings (1938 hatch) were received from the Sunderland State Fish Hatchery.

Distributions for the year to open waters were: 20,500 yearlings and 2,880 adults. In addition, 4,000 fingerlings were distributed to a club rearing pool and 5 adults were distributed for display purposes.

At the close of the year there are on hand 54,000 fingerlings, 20,000 yearlings, and 783 adults.

Rainbow Trout. — In December, 50,000 rainbow trout eggs were received from the U. S. Bureau of Fisheries Station at White Sulphur Springs, West Virginia, in exchange for brook trout eggs. In addition, 25,000 eggs were received from the Montague State Fish Hatchery.

Of the fingerlings on hand at the beginning of the year, 21,000 were transferred to the East Sandwich State Fish Hatchery, and 1,000 were distributed to a club rearing pool.

During the year 12,250 rainbows (2-year olds) were distributed to open waters.

At the close of the year there are on hand 16,000 fingerlings of this year's hatch.

Chinook Salmon. — During the year, 5,000 yearling chinook salmon were planted in open waters.

Sunderland State Fish Hatchery — John Norell, Fish Culturist, in Charge

1890 — LOUIS HORST — 1939

The death, on July 8, 1939, of Louis Horst, Fish Culturist, in charge of the Sunderland State Fish Hatchery, is a real loss to the Division and to the sportsmen alike.

Mr. Horst was born in Ober Ohmen, Germany, December 21, 1890. He entered the service of the Commonwealth with the Division of Fisheries and Game in 1915, at the Sutton State Fish Hatchery, under the direction of Mr. Arthur Merrill, then culturist in charge of that station. In 1920 Mr. Horst was assigned to the Sunderland State Fish Hatchery, then known as the Amherst Rearing Station, which at that time consisted of a few wooden troughs, a small shack, and some 6 acres of swamp land.

It was the keen foresight, wise planning, and untiring work on the part of Mr. Horst which was largely responsible for the development of this station into one of the finest trout hatcheries in the East. Not only is this station a well equipped and efficient plant for the production of fish, but a beautiful park and bird sanctuary as well.

Mr. Horst was a keen student of the science of fish culture, and during his many years at the Sunderland State Fish Hatchery he experimented in the culture of brown and loch leven trout, in the early days difficult species to propagate, and he has developed a strain of strong, hardy brown trout for Massachusetts waters.

Louis Horst was loved and respected by his fellowmen for his friendly, genial manner, his fearless honesty, his rugged simplicity, and his thorough genuineness. His quiet, unassuming manner and his willingness to cooperate endeared him to all with whom he came in contact. In the death of Louis Horst, the Commonwealth and the Department have lost a faithful servant, and his co-workers a friendly adviser.

New Construction and Replacement. — Throughout the year, the Works Progress Administration project which was started in 1938 continued with a limited crew of men, and accomplished the following: Stones were hauled to construct a flood water ditch 6 feet by 700 feet, to take the flood water from the State highway down through the hatchery grounds. One new pool 12 feet by 70 feet was built, and old pools reconstructed. Fifteen old wooden dams were replaced with concrete. The sides of 31 pools were dug out, regraveled and boarded. The supply pond for No. 1 hatch house was dug out, stone wall laid and ditches rip-rapped to prevent wash from entering. The No. 2 hatch house was sheathed inside and supply pond rebuilt. The supply pond for the hatch house sections was rebuilt with stone wall. An addition to the garage was begun, and will be completed next year. A new ice box was built; new sorting shelter with concrete foundation and floor completed except for a coat of paint and installation of toilet fixtures; stone retaining wall laid in front of garage; and concrete floor laid in the inside cellar under the garage. Although all this work has not enlarged the station to any great extent, it will greatly aid in the work and in the prevention of disease.

With the help of several men working under a storm damage emergency item, the debris caused by the 1938 hurricane was cleaned up and the following work accomplished: New shingles were laid on the culturist's house; a total of 12,500 board feet of pine were cut, and used in reconstruction of pools. Several thousand feet of ditch were cleaned of fallen and uprooted trees. A 150-foot concrete retaining wall was constructed to prevent a recurrence of the entrance of flood waters to the hatchery supply pond. From 15 to 20 cords of hard wood were cut from the uprooted trees. A new fence was constructed along the State highway. Several thousand trees were planted to replace those lost. About 10 acres of trees planted in the past 15 years had to be straightened and tied back to hold them in place until they had become firmly rooted again. Several pools were repaired where uprooted trees had damaged the sides.

New Equipment. — A new 1½ ton Dodge truck was purchased in the spring to replace the 1930 Ford truck. A gasoline pump and tank was installed.

Brook Trout. — For the work of the year, eggs were collected from the brood stock at the station, and in addition, 100,000 were received from the East Sandwich State Fish Hatchery.

Distributions from this station were 15,000 fingerlings of this year's hatch to the Sutton State Fish Hatchery; 10,000 fingerlings of last year's hatch to the Sandwich State Fish Hatchery, 13,500 fingerlings and 11,000 yearlings to club rearing pools; and 28 adults and 20 yearlings were distributed for display purposes. In addition, to open waters the following were shipped: 155,000 fingerlings (5,500 of the 1938-hatched fish and 149,500 of this year's hatch); 63,000 yearlings; and 5,300 adults.

At the close of the year there are on hand 71,540 fingerlings, 9,590 yearlings, and 206 adults.

Brown Trout. — For the work of the year, brown trout eggs were collected from the brood stock at the station. Distributions from this station for the year to open waters were: 152,000 fry; 121,200 fingerlings (45,200 of the 1938-hatched fish and 76,000 of this year's hatch); 50,000 yearlings; 27,600 adults. In addition, 35,000 (1938-hatch) yearlings were transferred to the Palmer State Fish Hatchery and 33 adults were distributed for display and study purposes.

At the close of the year there are on hand 186,700 fingerlings; 41,435 yearlings; and 1,425 adults.

During the fall of 1934 a number of brown trout (8-9 inches) had been tagged at the Sunderland State Fish Hatchery by inserting a small rubber tag into the abdomen, and the fish were released in Spectacle Pond, Lancaster. During the month of April, 1939, a number of these fish were caught and the tags returned to the central office. The sportsmen catching them reported that they averaged 17 inches in length and over 2 pounds in weight.

Sutton State Fish Hatchery — Michael O'Mara, Assistant Fish and Game Culturist, Acting in Charge

New Construction and Replacement. — With the National Youth Administration furnishing young men, and the Division providing the materials, the following construction was carried out.

Four wooden holding pools 8 feet by 10 feet were constructed in front of the new hatch house. Four old concrete pools in poor condition were torn out and replaced with a series of 3 pools 8 feet by 18 feet. Work was completed on the hatch house that had been started during the latter part of 1938. A ditch 285 feet by 4½ feet was dug from the culturist's dwelling to just back of the new hatch house and a water supply installed. Two wells were dug and stoned up in an effort to create an additional water supply. Two garage doors were rebuilt. Work has been completed on the foundation of a new meat house that is to be 20 feet by 30 feet.

Fifty large stumps were dug up and removed, in some cases requiring the use of dynamite to split the stumps so that they could be handled. There were 330 pine and hemlock trees, averaging 4 feet in height, transplanted from the back of the hatchery grounds to the lower end of the pool series, and an acre of the forest land on the hill thinned out.

Work was done, mostly by National Youth Administration labor, in repairing damage caused by the hurricane of 1938, as follows: 10,000 board feet of lumber was sawed (from trees blown down); the culturist's dwelling was reshingled; and the roofs of the barn and camp were repapered with asphalt paper. Two rooms in the dwelling house were papered and varnished, and small repairs were made.

New Equipment. — A 1½ ton Chevrolet truck was purchased and the 1½ ton 1933 Ford truck turned in.

General. — It was a year of unusual drouth conditions all over the Commonwealth, but the only station which suffered any serious effects from the drouth was that at Sutton.

Early in September a loss of brook trout was reported in the large pond at the hatchery. Specimens were autopsied, but the findings failed to reveal any disease.

Later in the month—on the morning of September 16—the men discovered that a heavy mortality of yearling rainbow trout had occurred in the lower pools of the hatchery during the night. At the close of work on the previous day, all the screens had been cleaned, there was a moderate flow of water through all the pools, and the fish were alive and in good condition. As there was no apparent cause for this loss, a telephone report was made to the central office. Immediately an investigation was made by the Biologist and two members of the staff of the Department of Public Health, who cooperated in making certain tests in connection with the water used at this hatchery, to determine, if possible, the cause of the death of such a large number of fish. The water which supplies the pools in which the losses occurred is from a sizeable pond located on the hatchery grounds, and in which brook trout are reared.

Tests were made to determine the amount of dissolved oxygen and free carbon dioxide in the water, the temperature, alkalinity, and pH of the water. In addition, certain microscopical examinations were made.

The results of the tests show, that while the water of the brooks feeding the pond contained a large amount of oxygen, the water of the pond and that in the rearing pools supplied from the pond contained only a small amount of oxygen. The amount in the rearing pond in which the heaviest losses occurred had been reduced to 22 percent saturation, or 2.2 parts per million.

The results of the microscopical examination indicate that the water of the rearing pools from which samples were collected contained microscopical organisms of various types and kinds, but that the number of organisms present probably would not interfere with fish life. It is the opinion of the Chief of the Water and Sewage Laboratories of the Department of Public Health, that

the cause of the death of the fish in question may be attributed to the decreased dissolved oxygen content of the water. At the time these losses occurred, the entire State experienced a serious drouth condition such as has not been known for years, and excessive and abnormal heat, which were undoubtedly contributing factors. The total loss of rainbow trout aggregated approximately 1,200 yearling fish.

During the year an experiment was made in the feeding of a ground, frozen fish product as a substitute for the usual pasteurized herring, but the experiment was terminated November 30 as the fish had not obtained a growth comparable to that of the fish fed on the hatchery diet which includes pasteurized herring.

Brook Trout. — For the work of the year, 30,000 fry were received from the Palmer State Fish Hatchery; 50,000 fry from the Sandwich State Fish Hatchery; and 15,000 fingerlings from the Sunderland State Fish Hatchery.

Distributions for the year to open waters were: 25,000 fingerlings; 42,500 yearlings; and 1,400 adults. In addition, 104 were distributed for display and study purposes.

At the close of the year there are on hand 43,800 fingerlings; 2,500 yearlings; and 35 adults.

Brown Trout. — During the year, 9,625 adults were distributed to open waters and 30 were distributed for display purposes.

At the close of the year there are on hand 8,717 yearlings.

Rainbow Trout. — During the year, 2,264 adults were distributed to open waters and 20 for display purposes.

In December, 10,000 fingerlings were received from the Montague State Fish Hatchery, and at the close of the year there are 7,681 yearlings on hand.

Merrill State Pond System — Eugene D. Moran, Assistant Fish and Game Culturist, in Charge

During the first nine months of the year, the pond system was in charge of Allan S. Kennedy, Assistant Fish and Game Culturist; but on the appointment of the latter to the position of Junior Fish and Game Biologist, the vacancy at the station was filled, from the eligible list, by Eugene D. Moran.

New Construction and Replacement. — There was no new construction at this station, but the buildings were painted and the equipment repaired. The fish tank was changed so that either oxygen or circulating air might be used, to make the handling of fish easier on long trips.

In the ponds the channels were covered with sand to facilitate the removal of the fish. In placing the sand in the channels it will soon be possible to remove the fish from the ponds without spending too much time seining.

Pondfish Culture. — The experimental wintering of the bass brood stock has been discontinued. During the heavy rains of September, 1938, many of the bass left the ponds, the number of which could not be determined until the ponds were drawn in April.

There was very little migration of the young fish, as there were no heavy rains during the summer to flood the ponds.

The yellow perch spawned very well, and the production of fingerlings was high.

All of the ponds have been drained and the brood stock was returned to insure production next year.

The ponds yielded for distribution to open waters during the period of this report, 180,093 pondfish and 900 forage fish, divided as follows: 8,900 calico bass, 109,316 horned pout, 60,537 yellow perch, 1,340 pickerel, 900 forage fish.

Field Work and Field Fish Culture

The development of fish culture in the State Forests was continued as the main work of the year in field work and field fish culture, under the direction of Arthur Merrill, Fish Culturist, especially in coordinating recreational fishing, fish culture, and investigations relative to fish and other wildlife. New pond

sites were located in anticipation of a more active period of pond building following a halt due to hurricane and flood clearance and repair. Whatever was done in pond building and repair was followed with close attention to the development of details that would give the ponds the fullest value and use for fish culture.

Other work was done during the year. Data was assembled for the preparation of information papers, but nothing was completed in print. In connection with this work, an experiment was carried out in the development of winter food areas and a practical way to keep the food so produced above the winter snow line. To further this work, an experimental nursery was started to produce material usable in further experiments. Following the flood in September, 1938, and the proposal for extensive stream clearance, a study was made of the development methods that would bring some measure of stream improvement into the work of stream clearance, either to lessen the damage from clearance, or in some contingencies to make a better condition than previous to the flood. Devices were developed with special reference to streams subjected to flood conditions.

The work on fish during the year featured a further development of the special plan for operating the Forest Ponds to reconcile what might otherwise be conflicting interests, and get a large utilization of the ponds rather than a limited one. This has made possible—

(1) That the public need not be deprived of a good measure of fishing in any Forest Pond.

(2) That combining fishing with fish culture brings a better balance to the pond, resulting in an increased production and better quality of the fingerling stock.

(3) That trout ponds can be given an added value, and kept in better condition for trout, if limited fish culture with selected species is also carried on.

(4) That special conditions making a pond most adaptable for the production of fish, also make it superior for general wildlife.

The propagation of fish in the State Forest ponds, and the special fishing connected with it, showed a marked advance in results, and in public appreciation of the aims. The ponds are constructed by the Civilian Conservation Corps with Federal funds, and they provide, when adapted to that purpose, an enormous capacity in rearing fish for public stocking. A public interest in fishing in so many detached and scattered ponds is taken care of by permitting the taking of breeders after spawning, when their continued presence in the pond would be an injury to production. The plan being better known, and the stocking for the year better, thousands of anglers were attracted to the ponds, a large percentage being family parties who combined angling with picnicking, because they found the orderly conditions in the State Forests most agreeable for this. As was foreseen, the plan resulted in a largely increased output for distribution.

Numerous ponds available for this purpose, and other ponds projected or under construction, provide a capacity for production limited only by the facilities for distribution, and there is no cost for construction or maintenance. Management of several ponds adaptable for production has been suspended for that purpose, but will, in connection with newer ponds devoted to production, provide a large production with short transportation trips in substantially all parts of the State.

Upper Spectacle Pond, Otis State Forest. — A concrete trap has been constructed at Upper Spectacle Pond since the last drainage. When it can be used to take out the pondfish, Upper Spectacle can be restored as one of the best trout ponds.

Lake York, Sandisfield State Forest. — Deficient drainage makes it difficult to take fish from Lake York and get a good cleanout. Pond fish are increasing in the pond, and will inevitably injure the trout fishing. When this state is reached the pond can be cleaned out by partial drainage and netting

as in the case of Upper Spectacle Pond. This should be planned for in the near future to preserve Lake York as the best of the trout ponds.

Benedict Pond, Beartown State Forest. — Drainage at Benedict Pond has been suspended, with the result that coarse fish have made an undue increase. The pond can be kept in better balance, and better fishing will result, if it is operated like Felton Lake, or the Harold Parker Forest Ponds. The matter of further drainage should be taken up in the near future.

Felton Lake, October Mountain State Forest. — The stock in Felton Lake for the year was small mouth black bass and horned pout. Bass fingerlings produced numbered 7,000; horned pout fingerlings, 31,000.

Burnett Pond, Savoy State Forest. — Construction was continued at Burnett Pond, but the dam was not completed sufficiently at the end of the year for flowage. It is expected that it will be completed in the spring of 1940, early enough for late spring or early summer flowage.

Bog Pond, Savoy State Forest. — The 1938 stocking placed in Bog Pond has shown a good increase from breeding, and the pond will be opened to fishing July 1, 1940.

Tannery Pond, Savoy State Forest. — The damage caused to the dam by the 1938 flood has not been repaired, and the pond will remain empty during 1940.

Dearth Hill Pond, Brimfield State Forest. — This pond was reconstructed and used as a trout pond in 1939.

Dean Pond, Brimfield State Forest. — Pondfish have not appeared in Dean Pond to mar its qualities as a trout pond, and the question of its drainage has not arisen.

Howe Pond, Spencer State Forest. — Reconstruction work at Howe Pond following the 1938 flood, provided better facilities for drainage, and opened the upper pond to drainage. Pondfish had become numerous since the drainage three years previous, and the pond was cleaned out to restore it as a trout pond. The drainage yielded 30 adult and 200 fingerling bass, 50 adult and 50 fingerling pickerel, 25 adult and 800 fingerling perch, 600 adult and 70,000 fingerling horned pout, and 1,000 shiners.

Crow Hill Pond, Leominster State Forest. — Crow Hill Pond has not been cleaned out since its construction. It is filling with pondfish and should be drained to keep its qualities as a trout pond.

Harold Parker State Forest Ponds. — Three of the ponds in the Harold Parker Forest, namely, Brackett Pond, Captain Collins Pond and Doctor Field Pond, comprise a fish-cultural unit, necessarily handled with some intermingling of product, and it is not practicable to consider them separately except in outline.

Operations began so late in the 1938 drainage that only a small percentage of fish from one pond had been taken at the close of the year, and the product of 1938 comes mostly in the 1939 distribution. The number produced in the breeding of the year was 718,320. Of this number 546,290 were distributed in 1939.

In the drainage for 1939 the work was advanced, and a larger percentage of the fish grown in that year were distributed, but a large number remained in the ponds for the 1940 distribution, and the extent of production could be only approximately outlined because two ponds remained untouched. Production and good growth with all species was indicated. Fingerling calico bass showed a weight increase of 100 percent, and fingerling horned pout 600 percent over 1938.

Other fish produced were pickerel in sufficient numbers to provide stock for a planned extension of the work to other Forest Ponds where pickerel is the intended production. Another attempt was made to introduce bass breeders in season for 1939 production, with indications following that there was some production, but for assurance that there would be some bass production for the adjacent part of the State, one pond was stocked with bass fingerlings for further growth. At the close of the year the work was not sufficiently advanced to determine results with bass.

During the year, work was started in an attempt to formulate a program for general improvement and finish in consideration of the fact that the location is one most frequented by the public, and new departures in fish production are attracting increasing attention. This planned work has experimental values, and one item, a three-acre dead swamp, was converted into a separate pond for use in 1940 as an experimental pond.

A program to be carried out by the use of Civilian Conservation Corps labor was started late in the year in providing increased bass spawning facilities, and improving the pond bottom for better drainage. Numerous gravel beds, both protected by frames and unprotected, were placed on the pond bottom, and work was started on the rough channel of irregular depth draining Doctor Field Pond, in smoothing and filling the deep places with sand. For the 1940 Civilian Conservation Corps program, surveys and plans were made for providing improved trapping and work facilities. During the year, driveways were roughed out that when completed will make it possible to store materials and equipment in less obtrusive locations than the fall work area, which in summer is frequented by many thousand visitors.

Frye Pond, Harold Parker State Forest. — Pondfish had increased in Frye Pond during the three years since the last drainage, and it was listed for 1939 drainage, but it became necessary to draw the pond in summer, after the trout season, for repair work on the dam.

Salem Pond, Harold Parker State Forest. — Two years had elapsed since the drainage of Salem Pond in 1937, but as it has not been restocked it was considered inexpedient to consider drainage this year.

Stearns Pond, Harold Parker State Forest. — For the second-year stocking in 1938, Stearns Pond was abandoned for trout and restocked with pickerel and horned pout, with remarkable results in breeding. No commitment has been made for taking this production out, and the question was not raised because of the impossibility of adding to the program attempted.

Salvage Unit No. 1 — William H. Seaman, Fish Culturist, in Charge

Three fyke traps and two new leaders were added to the equipment in the spring, to replace worn-out gear; a new 5-horsepower outboard motor was also purchased to replace worn-out motor; and a new half-ton Dodge truck was purchased, the 1936 Ford pickup being turned in.

Salvage operations were late in starting due to the spring distribution of trout, which extended well into April and to which the culturists in charge of salvage operations were assigned. Operations began at Salt Pond, Falmouth, where in previous years there has always been a supply of white perch. This year there were practically none present and the only conclusion that can be reached as to their absence is, that the hurricane and tidal wave of the previous September had caused the ocean to break through into this pond, pouring 10 feet of salt water above normal pond level. This apparently ruined the perch fishing.

All gear was transferred to Oyster Pond, Falmouth, where the crew were more successful, but fishing was somewhat below average. The culturist in charge of Salvage Unit No. 1 found fishing this season, as a whole, rather poor. At Wenham Lake, Beverly and Wenham, fishing was not up to other years, and this may have been due to treatment of the pond by the water department to eliminate the growth of algae. Heretofore fishing has been excellent in this particular pond. The same conditions existed at Crystal Lake, Wakefield.

The season was very dry, and moderate winds prevailed during the spring season, making ideal conditions for trapping operations, but the fish either were not there or could not be taken in the traps.

Some of the ponds which have been trapped for several years without interruption were not fished this year, because of the rapidly diminishing number of fish in them.

There were 108,553 adult fish taken and distributed by the salvage crew, as follows:

Salt Pond and Oyster Pond, Falmouth, April 18 to 28.—29,000 white perch planted in open waters. Total—29,000.

Great Pond, Braintree, May 1 to 3.—100 white perch, 200 yellow perch, and 50 horned pout planted in open waters. Total—350.

Weymouth Great Pond, Weymouth, May 3 to 12.—10,700 yellow perch, 2,600 horned pout, 30 pickerel, and 170 small mouth black bass planted in open waters. In addition, 180 small mouth black bass were turned over to the Palmer State Fish Hatchery for brood stock. Total—13,680.

North Watuppa Pond, Fall River, May 17 to 31.—2,750 blue gills, 15,650 horned pout, 10,400 yellow perch, 1,600 white perch, 830 small mouth black bass, and 182 pickerel planted in open waters. In addition, 210 small mouth black bass were planted in ponds on the Harold Parker State Forest. Total—31,622.

Wenham Lake, Beverly and Wenham, June 1 to 8.—50 pickerel, 475 white perch, 64 small mouth black bass, and 1,700 yellow perch were planted in open waters. Total—2,289.

Crystal Lake, Wakefield, June 12 to 16.—4,000 horned pout, 650 white perch, 67 pickerel, 475 small mouth black bass, 3,000 yellow perch, 1,200 blue gills planted in open waters. Total—9,392.

Butler Ames Pond, Tewksbury, June 16 to 22.—11,000 crappie, 11,000 blue gills, and 240 small mouth black bass planted in open waters. Total—22,240.

Salvage Unit No. 2 — Elmer A. Macker, Fish Culturist, in Charge

Three new fykes and leaders and a new 4-horsepower outboard motor were added to the equipment as replacements. The old Ford pickup was traded in and replaced with a new Dodge pickup which brings the motor transportation in this unit up to par.

The unit started operating on April 12 and continued through August in order to salvage the Quabbin area ponds before the flood waters backed up to make this work impossible. The latter two months of work was on ponds taken over by the Metropolitan District Water Supply Commission in the Quabbin Area. Here the number of fish taken was beyond expectation. Heretofore these natural great ponds have been considered normal ponds where the fishing was just average.

Contrary to the experience of Salvage Unit No. 1, the fishing was unusually good all season, and a large quantity of sizable fish were taken numbering 136,152, as follows:

Artichoke Basin, Newburyport, April 12 to 29.—9,340 white perch, 11,250 yellow perch, 350 horned pout, 20 small mouth black bass, 100 calico bass, 85 pickerel planted in open waters. Total—21,145.

Lake Chauncey, Westboro, May 1 to 17.—30,850 white perch, 150 yellow perch, 50 horned pout planted in open waters. Total—31,050.

Wyllie's Pond, Franklin, May 1, 10 and 12.—3,050 horned pout, 325 pickerel, planted in open waters. Total—3,375.

Ludlow Reservoir, Ludlow, May 19 to June 1.—2,300 yellow perch, 50 white perch, 575 horned pout, 1,343 small mouth black bass, 25 calico bass, 35 pickerel, planted in open waters. In addition, 10 calico bass, 10 horned pout, 25 yellow perch, 10 small mouth black bass, 25 long-eared sunfish, were delivered to the Springfield Aquarium for exhibition purposes. Total—4,408.

No Town Reservoir, Leominster, June 2 to 13.—23,300 yellow perch, 155 pickerel, 975 horned pout planted in open waters. Total—24,430.

Sudbury Reservoir, Southboro, June 15 to 20.—2,120 yellow perch, 160 small mouth black bass, 7 pickerel, 4 horned pout planted in open waters. Total—2,291.

Indian Lake, Worcester, June 21 to July 6.—7,222 white perch, 250 yellow perch, 6,697 calico bass, 6,082 horned pout planted in open waters. Total—20,251.

Ponds in Quabbin Reservoir Area (Quabbin Lake, Greenwich; Davis Pond, Enfield; Morton's Pond, Enfield; Pottapaug Pond, Dana; Curtis Pond, Greenwich; Greenwich Lake, Greenwich), July 7 to August 24.—20,265 horned pout, 4,677 yellow perch, 1,700 calico bass, 300 pickerel, 10 white perch, 800 forage fish planted in open waters. Total—27,752.

Miscellaneous Salvage

Several lots of miscellaneous fish were salvaged by employees of the Division and the fish planted in local ponds, except as otherwise noted.

From Greene's Pond, Franklin, 8,900 horned pout, 3,000 yellow perch, 200 pickerel. Total—12,100.

From DeFalco's Sandpit, Millbury, 2,000 horned pout.

From a small brook in Gill, 54 brook trout.

From Mann's Pond, Sharon, 3,000 horned pout.

From a small pond on Eaglebrook School Grounds, Deerfield, 12,000 horned pout.

From Robunta Stream, Athol-Orange town line, 9,800 horned pout and 10,200 yellow perch. Total—20,000.

From Beaver Brook, Royalston, 2,134 horned pout.

From Cunningham Pond, Hubbardston, 98 pickerel, sent to the Merrill State Pond System for brood stock.

From a small brook near Connecticut River, Northfield, 350 horned pout and 32 small mouth black bass. Total—382.

From Springfield Ice Company Pond, Springfield, 27,000 horned pout, 6,000 yellow perch. Total—33,000.

From Butterfield Pond, Burlington, 71 horned pout.

From a drain ditch in Orange, 2,500 horned pout.

Hand line Fishing for Bass.—In order to fill the requirements of bass brood stock at the Palmer State Fish Hatchery and in the fish-cultural ponds of the Harold Parker State Forest, two men were assigned to hand-line fish certain reservoirs. From this work 237 large bass were taken, of which 113 went to the Palmer station and 124 to the Harold Parker State Forest. The water and Sewer Department of the town of Winchester allowed the Division to fish the reservoirs of that town, resulting in the taking of many excellent bass which spawned soon after being transferred to the culture ponds. The Division takes this opportunity to express its gratitude for the very splendid cooperation.

Salvage of State Forest Ponds — Arthur Merrill, Fish Culturist

Salvage operations were conducted in some of the State Forest ponds by employees of the Division and the fish distributed to public waters, except as otherwise noted.

Collins Pond, Brackett Pond, Doctor Field Pond, on the Harold Parker State Forest, December 1, 1938 to January 28, 1939, and November 8 to 29.—151,996 calico bass, 518,305 horned pout, 5,390 yellow perch, 203 pickerel, 11,539 blue gills. In addition, 163 horned pout were turned over to a club for its rearing pool. Total—687,596.

Felton Lake, on the October Mountain State Forest, Oct. 25 to Nov. 1.—6,528 small mouth black bass, 32,450 horned pout. Total—38,978.

Howe Pond, on the Spencer State Forest, Oct. 20.—230 large mouth black bass, 825 yellow perch, 100 pickerel, 70,500 horned pout. In addition, 1,000 shiners were sent to the Palmer State Fish Hatchery. Total—72,655.

Ayer State Game Farm — Edward E. Backus, Game Bird Culturist, in Charge

New Construction and Replacement. — During the winter and early spring months, work was continued on the land-clearing and road-building Works Progress Administration project started late in the summer of 1938. In all, about 20 acres were cleared of trees and brush; logs and useful firewood

were piled, and debris burned. Approximately one acre was completely cleared of stumps and roots as a site upon which a summer range pen for pheasants could be erected. The road between the older portion of the farm and the new section was completely rebuilt to render it passable in all weathers, and the other farm roads repaired, a total of approximately 1,500 feet.

On November 1 (under another project) ground was broken for the erection of a modern pheasant brooder house to replace the 7 small wooden colony houses formerly used as starting houses. The new building will comprise a passage-type brooder house of new design, 120 feet long by 16 feet in width and containing 12 brooder units. On one end is to be erected a feed and equipment storage section, 16 feet square and two stories in height, which will eventually form the central section when a second 120-foot wing is extended beyond it. The cement foundation walls and floor were cast during the month, further building construction to be continued as funds become available.

About 800 feet of 4-foot trench was dug for laying permanent water and drainage lines. The loam excavated from the brooder house site was used for grading the area about the culturist's residence from whence the stumps of hurricane-wrecked trees had been removed.

With State funds, under a storm-damage appropriation, the work of rehabilitation was gotten under way in the month of February. A crew of men cleared up the fallen trees, salvaging the logs suitable for sawing into lumber and the useful fire-wood, and burning the slash. Later in the season, when the frost went out of the ground, several hundreds of stumps were dynamited and removed, the saw logs were hauled away, sawed into lumber, and the lumber returned and properly stacked, producing over 26,000 board feet of excellent material for future construction work.

The wreckage of the guard fence was removed and a new one constructed in its place, using heavy cedar posts. About 1,500 feet required rebuilding.

The summer range pens for pheasants, badly damaged by flood, were removed from the low land near the river and re-erected on the higher, newly cleared area, the outer fence being made permanent by the use of cedar posts and top rails. Thirty quail breeding pens and two pheasant brooder houses received extensive repairs, and minor repairs were made to the roofs of the garage and workshop. About 20 of the pheasant breeding pens, too badly damaged to repair, were demolished, all useful material salvaged, and 10 new replacement pens of standard type constructed.

With State funds from regular appropriations, during the late spring and with the labor of the regular station force a comfort station was erected for the use of the farm personnel and convenience of visitors. This building, 10 feet by 10 feet in area, of sheathed and clapboarded frame construction on a substantial concrete foundation, was supplied with a septic tank sewage system and piped for running water. A flush toilet bowl, lavatory and shower bath were installed and a small wood or coal-burning heater, with a 30-gallon boiler, was provided to supply hot as well as cold water and to keep the plumbing from freezing in cold weather.

Late in the summer the bath room in the dwelling house was completely reconditioned, the walls being covered with tile board, the floor leveled and covered with rubber tile, a modern tub and lavatory installed, and woodwork painted. A new floor was laid in the sink room, the walls sheathed with hardboard, the window relocated and replaced with a mullion constructed of salvaged material, and the old iron sink replaced by one of porcelain enamel. The room was repainted throughout.

In the early fall an implement and storage shed was erected on a site immediately west of the garage, filling a long felt need for a structure in which the various bulky farming tools and equipment could be stored, protected from the elements. This shed, of open-front type, has a width of 30 feet and a depth of 20 feet, with two 10-foot square lofts for storage of light equipment. With the exception of the outer covering of building paper, it was constructed entirely of salvaged material.

The garage, workshop and pump house were repainted with material on hand, by the regular force.

Taking advantage of the extreme low water in the pond, resulting from the season's unprecedented drouth, considerable work was carried out to improve the pond on the property and to increase its value, both as regards the fire protection it affords and its facilities for producing a supply of fish for raccoon food. A deep ditch was blasted and dug on the pond side of the dike to reach and stop the troublesome subterranean leaks which had caused much wastage of water. Flood damages to the dike were repaired and the juncture of dike and dam reinforced by the construction of a bulkhead and a substantial earth fill. A wharf, to permit of ready access to deep water at all times, was built, the spillway bridged to render the dike accessible for truck or tractor, and the pond bottom dredged over a considerable area, removing many tons of mud, stumps and old sod, thereby increasing the depth considerably. The stumps were removed from a large area. All the material used was either of farm origin or salvaged.

In November, the southern half of the new summer range area, comprising approximately an acre, was completely cleared of stumps and roots and then plowed and graded, the larger stumps having been dynamited in the spring operations.

With the discontinuance of the cottontail rabbit experiment, such equipment as was not converted to other uses was dismantled, the material salvaged, and work was started on the conversion of the breeding pens into intermediate pheasant rearing pens.

New Equipment. — To render possible the removal of the hundreds of stumps left in the wake of the hurricane and to fit the land so cleared for productive use, a John Deere Model B. tractor, equipped with two-way plows and with a brush-and-bog harrow, was purchased in May. This purchase proved wise and economical, and most satisfactory in the work accomplished.

Pheasant Breeding. — Prior to the opening of the breeding season, 1,431 adult pheasants were distributed.

The results of this year's hatch were 977 day-old chicks distributed for rearing, 1,149 sixteen-weeks old pheasants released in open covers, and 2,687 are being carried through the winter.

After the breeding season, 108 breeders were released in open covers and 213 breeders are on hand November 30.

Quail Breeding. — Noteworthy in the quail breeding operations was the continued high production in the selectively bred stock. Due to late spring, laying was about two weeks later than normal, but when once started the birds were most productive.

Despite the late season and an extremely hot, dry summer, 4 hens laid from 130 to 137 eggs each; 3 laid 125 each; 2 over 120; 10 from 112 to 119 eggs each; and 16 laid between 101 and 110. Only 5 hens surviving the entire season laid less than 80 eggs. Number 89, in her fourth laying season, produced 116 eggs, her previous totals being 147 for 1938, 155 for 1937, and 126 for 1936. Only 20 of her eggs failed to hatch. Three of her daughters laid 133, 134, and 137 eggs respectively in this, their first laying season.

The earlier hatches of quail chicks lived well, but losses were increasingly heavy in the later broods. Much of this was undoubtedly due to the long periods of extremely hot weather when temperatures in the brooder house ranged over 100 degrees day after day. Some digestive trouble was experiencd, due, presumably, to the difficulty of keeping stored feed in proper condition during the extreme heat.

Prior to the opening of the breeding season, 146 adult quail were distributed. In addition, 1,710 young quail were liberated in open covers and 302 of this year's hatch are being carried through the winter.

After the breeding season, 120 breeders were released in open covers and 136 breeders are on hand November 30.

Reeves Pheasants. — Little progress has been made in developing ways and means for producing these birds on a practical scale. The season began with six hens and two cock birds, but it was not possible to rear a single young bird from the breeders. Many obstacles have been found in the way of producing these birds in profitable numbers, even if there were a probable value for stocking purposes. The hens are very poor layers, producing, on the average, about twelve eggs in a season. While the eggs hatch well, the chicks do not thrive on the food or under the methods used so successfully in rearing ring-necked pheasants. The few birds which have been reared in the past were reared in much the same manner as grouse chicks, a far too laborious and expensive procedure for the production of any pheasant.

The young birds are found to be extremely pugnacious during one stage of their development, and cannot stand crowding in even comparatively small broods, but must be kept in broods of a dozen or less. There is every evidence to point to the probability that any attempt to naturalize this bird in Massachusetts would produce negligible results. Several states, notably Pennsylvania and New York, have tried repeatedly to establish them, but without success, and Massachusetts tried and abandoned the attempt many years ago. (See annual report of the Commissioners on Fisheries and Game for 1916). In other states where this work has been attempted experimentally, the consensus of opinion is that, while the Reeves pheasant is perfectly hardy and well adapted to cope with the severity of our winter climate, it is an easy victim for our indigenous predators, and there is no record of any plantings, so far as is known, surviving over the first season.

In view of the foregoing, it was decided to discontinue further experimentation with this species, and the stock on hand was liberated on the game farm property after the closing of the upland game season. In so far as possible, close observation will be kept on their behavior under field conditions.

Cottontail Rabbit Breeding. — The experiment of breeding cottontail rabbits was discontinued, as there was no evident advancement being made.

The first two years' work with these animals appeared to hold much promise of eventual success in the mass production of the cottontail in captivity, if certain obstacles had been overcome. These obstacles, during those two years, were the disinclination of the animals to breed in confinement, to properly care for such young as were born, and the tendency on the part of the females to destroy their young either at birth or after weaning. It was hoped that these difficulties would be eliminated to some extent, once a stock of cottontails had been developed that had been bred and reared in confinement for several more generations. This hope was largely confirmed, as time elapsed. During these two years little or no loss was experienced in rearing the young once they had been weaned, and a young cottontail a month or five weeks old was considered as good as reared. The number of does failing to breed had been greatly reduced, and few litters had been destroyed or neglected by their dams. In the present season no doe produced more than a single litter, due principally to the fact that there were but four males available and they apparently were not vigorous breeders.

However, a serious contingency has arisen that renders the success of the experiment extremely doubtful. The heavy loss of young rabbits after weaning, which was about 80 percent, affected animals from 4 to 12 weeks of age. That this loss is not one due to any inbred weakness in the stock because of the artificial environment under which the broods have been bred and maintained, is evidenced by the fact that young rabbits of wild birth, successfully reared by hand to weaning age, have died off as readily as those of the pen-bred stock. The young animals were apparently in good health up to within a few hours of death. Because of the lack of proper equipment and a sufficient staff to make the exhaustive pathological examinations that would establish the causes of these losses, it is not possible to pursue this study.

After careful consideration, it was decided to abandon the experiment and distribute all young and adult animals on hand. The greater part of the equip-

ment used in this experiment will be converted for rearing pheasants and raccoons, with a minimum cost of labor and with no cost for further material. The breeding pens will be converted into intermediate pheasant pens with the carrying capacity of some 1,500 birds. The hutches will be used as quarantine pens for raccoons.

The year opened with 37 adult rabbits on hand (28 of the old brood stock and 9 transferred from young). Of these, 2 were lost and 35 were on hand for the breeding season.

During the breeding season there were 17 litters born (40 born alive and 9 born dead or died immediately after). To these were added 17 brought in by conservation officers, making a total of 57. Of these, 46 were lost and 11 liberated in open covers.

Of the 35 rabbits on hand at the beginning of the breeding season, 13 were lost and 22 liberated in open covers.

Raccoon Breeding. — The propagation of raccoons for this station received a very serious setback when an epidemic of disease and of an extremely fatal nature broke out early in the year. Pathological examination of dead specimens by the Lederle Laboratories in New York and by Dr. David L. Belding of the Boston University School of Medicine and his collaborators, established the identity of the disease as a form of distemper, complicated by a secondary infection of a pneumonic character (*Salmonella enteritidis*), this secondary infection being responsible for the extreme fatality of the disease.

Since so far as could be learned, no disease of this nature had ever occurred among stocks of raccoons maintained in New England, it is presumed that the disease was brought in in a latent stage with some of the animals imported from the middle West earlier in the season. Every known method was used to combat the disease, but to no avail. With a single exception, and that a home-bred male cub, every animal that exhibited symptoms eventually died. Rapid hypodermic injections of anti-distemper serum, successful in the treatment of distemper in dogs, proved of no value either as a cure or preventative. Heavy dosages of sulfanilamidae administered orally, a specific for the treatment of *Salmonella* infections, were also nonproductive of results.

Of the 95 raccoons on hand in the beginning of the fiscal year, 70 were lost, all but 2 of these dying during the epidemic. The 25 animals surviving were either immune or so slightly affected as to exhibit no outward traces of illness, although all were equally exposed.

Three raccoons received through confiscations by conservation officers were deliberately quartered in pens where animals had died of the disease, but failed to contract it. Because of this it is presumed that the organisms responsible are unable to maintain their virulency in the soil or in the kennels.

No males of breeding age survived, therefore no cubs were born during the year, and there remain on hand as a brood stock for next year 18 females and 9 males.

The year opened with 95 raccoons on hand (33 cubs and 62 brood stock), to which were added 2 brought in by conservation officers and one received as a gift, making a total of 98. Of these, 71 were lost and 27 remain on hand November 30.

Marshfield State Game Farm — Lysander B. Sherman, Game Bird Culturist, in Charge

New Construction and Replacement. — The Works Progress Administration project for a second wintering pen, work on which started in October of 1938, was finished early in 1939, with some assistance from the game farm employees.

Storm damage repair work was carried out by the game farm men and National Youth Administration labor. The damage to the 70 old pheasant brood pens was much greater than had been thought at first, and these pens, which had been in use since the farm was first started, had to be taken down.

The new pens were erected, not at the same location but in the orchard where some of the quail pens were cleared out. They are each 10 feet by 10 feet by 6 feet high, with 2 feet of boards at the bottom, painted white, except the bottom boards are stained green. The culturist built 70 new feeders, weather proof, of 5 compartments each, to protect the feed and water for the birds at all times.

All the yards in front of the No. 1 large brooder house were taken down, having been much weakened by the storm. Built about 1921, they had been repaired until past repairing. The new yards are 80 feet deep, 200 feet long and 6½ feet high, covered over the top with wire netting, divided in yards 10 feet long, having two doors in each section, and painted white. Much of the top ground—to the depth of a shovel blade—was removed, new sand carted in and spread. The fence around the quail house built in 1936 and 1937, leveled by the hurricane, has been partly replaced by labor of the game farm men and one carpenter and one laborer for one week. It will be completed by the game farm employees during the next fiscal year.

When the quail pens were removed from the orchard to make room for new pheasant pens, new land was cleared, many of the quail pens and yards were repaired, and four new complete units built. New floors were laid where needed, new tops put on, and many covered with new wire. Seventy-five five-compartment weatherproof feeders were built and put in them.

At the time the new pheasant brood house on the hill was put up last year, many of the quail pens and runs for young quail had to be removed to make room for the runs of the pheasant house. This year new sand and gravel was carted in and spread to make room for two lines of pens and runs for young quail. This work was done by the men on the farm, with the help of the National Administration labor.

Pheasant Breeding. — During the year, 2,023 adults were liberated in open covers (1,725 of which were released prior to June 1) and at the close of the year there are 218 breeders on hand.

The results of this year's hatch were 1,760 day-old chicks distributed for rearing, 3,340 pheasants (16 weeks old) released in open covers, and 2,874 are being carried through the winter.

Quail Breeding. — Prior to the opening of the breeding season, 161 adult quail were distributed.

As a result of this year's hatch, 1,500 quail were released in open covers and 156 are being carried through the winter.

After the breeding season, 65 breeders were released in open covers and 60 breeders are on hand November 30.

About the middle of October, the station was seriously concerned with an outbreak of disease among both the adult and the young quail. Fortunately, this disease did not make its appearance until after the season's work had been completed, and most of the birds affected were the young which were being carried over to liberate in the following spring.

Sandwich State Game Farm — J. Albert Torrey, Game Bird Culturist, in Charge

New Construction and Replacement. — A Works Progress Administration project for the construction of an addition to the incubator cellar and workshop was completed. It consisted of an 8-foot cement cellar, 24 feet by 20 feet, and a pump house cellar 8 feet by 10 feet. The workshop was constructed over the cellar, 8 feet high, of wooden construction, equipped with work benches, and with storage space in the attic. Two wells were driven for the water system, and a thousand-gallon pump and 2,000 gallon tank were installed, as well as lavatory and toilet with cesspool.

About November 1, a Works Progress Administration project started work to take down certain pheasant brooder house pens and replace same. The new pen is to be 320 feet long, 40 feet wide, constructed of cedar posts, 2 x 4 top

stringers, wire-covered top, sides and partitions. Completed, it will make 24 brooder pens. At the close of the year the old pens are dismantled, cedar posts set in the ground, and about one-half of the top stringers placed.

With the assistance of labor from the National Youth Administration, several projects were completed, namely: three colony houses 9 feet by 10 feet, with cement foundations and floors; sun porch, 7 feet by 24 feet, added to workman's cottage; three additional covered pheasant pens, about 5,000 square feet in area. Also 700 feet of water pipe was laid below frost; pheasant houses, pens, etc., repaired; and posts, boards, roofing paper, cement floors and wire replaced.

New Equipment. — A unisaw outfit was added to the station equipment, for construction work about the farm, such as pens and coops.

Pheasant Breeding. — During the year, 2,222 adults were liberated in open covers (approximately 2,000 of which were released prior to June 1) and at the close of the year there are 149 breeders on hand.

The results of this year's hatch were 5,093 pheasants (16 weeks old) released in open covers, and 3,231 are being carried through the winter.

Quail Breeding. — The quail were late in laying, due possibly to the backward, cold spring. The eggs hatched well and the viability of the young chicks this year compared favorably with other years.

During the breeding season there was a heavy mortality among the adult birds, due to the presence of quail disease, but it was possible to keep it well under control and from spreading through the entire flock. During the latter part of September, quail disease (ulcerative enteritis) made its appearance in one pen of young birds. These birds were destroyed, as well as the box and pen in which they had been quartered. This did not, however, stop the spread of the disease, and a total of 504 young quail, which were on hand to be carried through the winter for liberation next spring, had died at the close of the fiscal year. Every precaution known was taken in the way of sanitation, disinfection and sterilization, and all ground which might be contaminated by infected birds was burned and covered with fresh sterile sand.

As a result of this year's hatch, 2,030 quail were released in open covers, and 159 are being carried through the winter in addition to 115 breeders which are on hand November 30.

Chukar Partridge Breeding. — Twelve Chukar partridges were carried over from the previous year's production, and 10 were presented to the Division by the Falmouth Rod and Gun Club to assist in carrying out breeding experiments with this bird. Quail equipment was used for all experiments. When the birds were placed in breeding pens, a number of the females were killed by the males. Two females died from unknown causes, and at the end of the laying season four females were alive.

Almost every young bird lived beyond the age when losses were expected. During the height of the season many of the young birds were affected with an unidentified disease which later was diagnosed as a virulent form of coccidiosis.

There were 54 young Chukars reared this year, and they are being carried through the winter in addition to the 12 breeders which are on hand November 30.

Wilbraham State Game Farm, — Frederick W. Wood, Game Bird Culturist, in Charge

New Construction and Replacement. — Repairs were made to buildings and equipment, charged to storm damage, as follows:

In order to draw the barn back into place, three three-quarter inch tie rods with turnbuckles were put in; new shingles were put on the roof and new doors and transoms installed,—so that the building is now in first-class condition.

Nine new power line poles were bought and set up, new brackets put on, the old wire put back, with some new wire where it had been damaged when the poles were blown down. Several of the trees along the road had been pulled down with the power line, and these were set up and appear to be well rooted and growing.

Ten pheasant breeding cages were built to replace those damaged beyond repair by the storm; also 24 quail breeding and 3 quail holding cages.

The guard fence, which was badly damaged, was replaced.

A new feed house, 20 feet by 20 feet, has been built, wired for lights and equipped so that it can be used for housing extra help working on the farm during rush season. This was built to replace the feed house that was completely demolished by the storm.

With State funds two bed rooms and the hallway in the farm house were repainted and papered; also new grates were put in the boiler and new steam valves and air vents installed, putting the heating system in good condition.

On November 13 a Works Progress Administration project was started to construct a quail brooder house (60 feet by 14 feet) to replace the one built in 1933. The new house will have 9 brooders in place of four in the old house. It will be constructed as near fly-proof as possible,—a matter of importance in the rearing of chicks, and the main drawback of the old brooder house.

This project will also paint all buildings constructed prior to 1936, and will therefore include everything except the last pheasant brooder house. The project will be completed during the year 1940.

New Equipment. — A 1½ ton Chevrolet truck was purchased.

Pheasant Breeding. — Reasonable success was experienced during the laying period, but fertility in the eggs was slightly below normal. While the fertile eggs hatched very well, there was some mortality from the fifth to the twelfth day, after which rearing proceeded in a normal way.

The severe midsummer and early fall drouth caused a shortage of green food at a time when it was most needed. There was a minimum of feather picking during the rearing season, and all birds liberated were in excellent plumage.

Approximately 2,445 adults were liberated in open covers prior to May 15, and at the close of the year there are 402 breeders on hand.

The result of this year's hatch was 4,818 pheasants (16 weeks old) released in open covers, and 3,075 are being carried through the winter.

Quail Breeding. — Quail rearing was successfully carried on with an exceptionally good year up to the first of September, when some loss was experienced. It was felt this mortality may have been caused by the birds eating the common house fly, more numerous this year than usual.

During the year, 117 adult quail were distributed, and there are 175 breeders on hand November 30.

The result of this year's hatch was 2,640 liberated in open covers, and 479 are being carried through the winter.

Ruffed Grouse Breeding. — A new system of mating was used for the first time this year, using one of the 80 x 10 by 7-foot intermediate pheasant yards. Twenty feet of this yard was sectioned off in the middle with two 4-foot fences. In this area a wing-clipped cock bird was placed with 6 full-winged hens. Because the cock was wing-clipped, he was forced to remain in this section, but the hens could come and go at will. The remaining 4 hens were mated by the usual method, that is, in the wire-bottom breeding and holding pens, one hen to each cock.

Conservation officers brought 36 eggs to the station, which were obtained from nests abandoned in the wild.

As a result of this year's experimental work, 17 young grouse are on hand at the close of the year in addition to 8 breeders.

FISH AND GAME STOCKING AND DISTRIBUTION

Stream Survey

The survey of streams in Massachusetts, begun several years ago, was continued. Three crews were in the field from April 1 until September 30, composed of two students on placement by the Stockbridge School of Agriculture, Amherst; a graduate of the school; a Massachusetts student from Graduate School, Cornell University, majoring in the field of conservation; and a Mass-

achusetts student from McGill University, Quebec, Canada. These men were organized into survey units, and made studies of streams on the Housatonic, Chicopee and Merrimac River Systems, as well as completing a survey of the Quinnebaug River which was started in 1938. The field work was carried on along the same lines as described in previous reports.

The abnormally dry conditions prevailing throughout the summer and fall, when the field work was in progress, was responsible for the partial or complete drying up of a great many streams. This was true of the streams in all systems surveyed. Thus in many cases the data obtained was not at all representative of the streams during a normal summer. Due to the drouth conditions, many brooks and streams were not surveyed in detail, and it is felt that a recheck should be made, during a more normal season, of the greater part of this year's work. Until this has been done, many miles of stream which have been thought suitable for trout of various species cannot be classified with accuracy. The work on the individual systems and streams was as follows:

Quinnebaug River System

Most of the streams of this system had been surveyed in 1938, and the remaining six streams, having a total of 15 miles of water, were surveyed this year. A description of this system was given in the 1938 annual report.

Chicopee River System

The Chicopee River System is one of the largest in Massachusetts. It extends over an area roughly estimated as about 700 square miles, and includes all streams which eventually send water into the Chicopee River. Located in four counties (Worcester, Franklin, Hampshire and Hampden), this system has widely diversified types of stream. Those of the Swift River watershed are in general rapid, rocky and flood-swept, typical of the mountainous country through which they flow. Most of the streams of this watershed (above the Quabbin Dam) were surveyed in 1938, and the few remaining ones were surveyed this year.

The streams located in the Quaboag River watershed tend to be swampy, wide and deep. This watershed, rising in Spencer, Paxton, Rutland and Oakham, has an exceptionally large number of ponds and lakes. Some streams were surveyed in the towns mentioned above and also in the towns of Brimfield, Monson and Palmer.

The streams of the Ware River watershed cannot be put into any one classification. Those of the upper section (now controlled by the Metropolitan Water Works) are not unlike the streams on the Swift River but are not so violent in their descent and are in general very good trout streams.

These three rivers, namely, Swift, Ware and Quaboag, join at Three Rivers in Palmer to form the Chicopee River, which continues westward for nearly 15 miles to empty into the Connecticut River.

Summary of the portion of the Chicopee River System surveyed in 1939:

Number of streams surveyed	82
Total mileage of these	260.5

Housatonic River System

The northern half of the Housatonic River System's 500 square miles of watershed was surveyed during the summer of 1939, field activities commencing May 10 and terminating September 10.

The area surveyed roughly represents most of central Berkshire County in the towns of Lanesboro, Pittsfield, Hancock, Dalton, Windsor, Peru, Hinsdale, Washington, Lenox, Stockbridge, Lee and Tyringham. Except for a few of the larger valley streams, most of the water here is mountain run-off, often originating at an elevation of 2,000 feet. Consequently, a high proportion of these brooks are, by the very nature of their physical characteristics, rather

infertile, tend to dry considerably during the summer months, and are not, in general, productive trout habitat.

The streams originating on the abrupt eastern face of the Taconic Range along the western border of the system have a rather common and characteristic failing, i. e., a tendency to subterranean run when they reach the bottom of this schistose range because of geological faults and loose porous beds of shale and schist debris.

The survey covered the Housatonic River and its three main branches, and numerous tributaries as far down as Stockbridge.

Summary of the portion of the Housatonic River System surveyed in 1939:

Number of streams surveyed	123
Total mileage of these	259

Without doubt the summer presented extreme conditions. The rainfall was the lowest in decades, and the scouring effect of late September's flood combined with this to make evaluation difficult. Streams in this system will be rechecked during a season of more normal conditions.

The following table shows the average precipitation of the four months of May, June, July and August, 1929 to 1939, from the weather records of the Department of Public Works of the city of Pittsfield. It can be clearly seen that this season's rainfall is far below average.

Month	*Average of 11 years—inches*	*1939*
May	2.842	1.27
June	3.693	2.78
July	3.880	1.59
August	3.862	3.26
Four-month rainfall	14.277	8.90

Stream and Pond Investigations

The usual number of requests for special investigations and surveys of ponds and streams was received, but with the limited number of trained men available to carry on these investigations it is impossible to comply with them all, making it necessary, as in the past, to carry them over the next year. Some of the ponds surveyed were: Peter's Pond, Sandwich; Long Pond, Plymouth; Shubael's Pond, Barnstable.

White Hares and Cottontail Rabbits

The Division, during the year, distributed 7,706 white hares which arrived in a strong, healthy condition from Canada. Not included in this number were some which died during transportation. Autopsies were performed on these by Miss Beulah Merrill, attached to the staff of the Massachusetts Memorial Hospitals. It was important to find no tularemia in any of these.

No purchase of cottontail rabbits was made, however, for their abundance was manifest in sufficient numbers, in all parts of the State, to provide good rabbit hunting. There is no affirmative evidence that the present abundance reflects favorably on the previous stockings with western rabbits, as the latter are not known to cross with the native stock. Furthermore, the cottontail situation does not warrant such use of State funds, which can be devoted to other purposes with greater profit to the sportsmen. There is also the danger of introduction of disease.

A trapping program for the purpose of obtaining a new brood stock of cottontail rabbits for Penikese Island, resulted in 81 animals secured on the Beartown State Forest and added to the stock already on the island.

Restocking

The distribution of fish to open waters is detailed in the following table:

FISH DISTRIBUTED FOR THE PERIOD DECEMBER 1, 1938, TO NOVEMBER 30, 1939
(This table does not show stock transferred from one station to another, eggs exchanged with the U. S. Bureau or State Commissions, nor does it show additions to brood stocks)

	PRODUCT OF STATE HATCHERIES			NOT HATCHERY PRODUCT		PRODUCT OF THE STATE FOREST PONDS		GRAND TOTAL
	Planted direct to public waters	Distributed to clubs for rearing to larger size before liberation	Distributed for study, exhibit, etc.	Planted direct to public waters	Distributed for study, exhibit, etc.	Planted direct to public waters	Distributed to clubs for rearing, for study and exhibit	
Brook Trout:								
Eggs	101,664	–	–	–	–	–	–	101,664
1–3 in.	358,000	8,100	–	–	–	–	–	366,100
3–6 in.	108,162	22,000	3	–	–	–	–	130,165
6–8 in.	220,844	–	104	30,054	–	–	–	251,002
8–11 in.	19,999	–	49	13,550	–	–	–	33,598
11–12 in.	190	–	–	–	–	–	–	190
12 in. and over	1,850	–	19	–	–	–	–	1,869
Total Brook Trout:								
Eggs	101,664	–	–	–	–	–	–	101,664
1 in. and over	709,045	30,100	175	43,604	–	–	–	782,924
Brown Trout:								
Eggs	–	–	–	–	–	–	–	–
Fry	–	–	–	–	–	–	–	–
1–3 in.	273,200	–	–	–	–	–	–	273,200
3–6 in.	25,625	–	–	–	–	–	–	25,625
6–8 in.	41,401	–	11	–	–	–	–	41,412
8–11 in.	41,774	–	25	2,700	–	–	–	44,499
11–12 in.	–	–	–	–	–	–	–	–
12 in. and over	2,850	–	33	–	–	–	–	2,883
Total Brown Trout:								
Eggs	–	–	–	–	–	–	–	–
Fry	–	–	–	–	–	–	–	–
1 in. and over	384,850	–	69	2,700	–	–	–	387,619
Rainbow Trout:								
1–3 in.	25,000	–	–	–	–	–	–	25,000
3–6 in.	–	19,000	–	–	–	–	–	19,000
6–8 in.	23,795	–	–	1,000	–	–	–	24,795
8–11 in.	74,224	–	12	7,000	–	–	–	81,236
11–12 in.	–	–	–	–	–	–	–	–
12 in. and over	4,005	–	42	–	–	–	–	4,047
Total Rainbow Trout:								
1 in. and over	127,024	19,000	54	8,000	–	–	–	154,078

Small Mouth Black Bass:								
Under 6 in.	46,050	–	–	75	–	6,528	–	52,653
Over 6 in.	–	–	–	3,077	10	–	–	3,087
Over 12 in.	–	–	–	182	–	–	–	182
Total Small Mouth Bass	46,050	–	–	3,334	10	6,528	–	55,922
Large Mouth Black Bass:								
Under 6 in.	–	–	–	–	–	200	–	200
Over 12 in.	–	–	–	–	–	30	–	30
Total Large Mouth Bass	–	–	–	–	–	230	–	230
Chinook Salmon:								
Under 6 in.	–	–	–	–	–	–	–	–
Over 6 in.	5,000	–	–	–	–	–	–	5,000
Total Chinook Salmon	5,000	–	–	–	–	–	–	5,000
Crappie and Calico Bass:								
Under 6 in.	8,900	–	–	5,500	–	150,736	–	165,136
Over 6 in.	–	–	–	13,922	–	1,260	–	15,182
Over 12 in.	–	–	–	100	10	–	–	110
Total Crappie and Calico Bass	8,900	–	–	19,522	10	151,996	–	180,428
Horned Pout:								
Under 6 in.	106,600	–	–	56,194	–	610,150	–	772,944
Over 6 in.	2,716	–	–	64,337	–	11,105	163	78,321
Over 12 in.	–	–	–	929	10	–	–	939
Total Horned Pout	109,316	–	–	121,460	10	621,255	163	852,204
Blue Gills:								
Under 6 in.	–	–	–	11,000	–	11,539	–	22,539
Over 6 in.	–	–	–	3,950	–	–	–	3,950
Total Blue Gills	–	–	–	14,950	–	11,539	–	26,489
Pickerel:								
Under 6 in.	–	–	–	–	–	–	–	–
Over 6 in.	–	–	–	200	–	75	–	275
Over 12 in.	1,340	–	–	1,236	–	228	–	2,804
Total Pickerel	1,340	–	–	1,436	–	303	–	3,079

	Product of State Hatcheries			Not Hatchery Product		Product of the State Forest Ponds		Grand Total
	Planted direct to public waters	Distributed to clubs for rearing to larger size before liberation	Distributed for study, exhibit, etc.	Planted direct to public waters	Distributed for study, exhibit, etc.	Planted direct to public waters	Distributed to clubs for rearing, for study and exhibit	
Yellow Perch:								
Under 6 in.	59,700	–	–	6,000	–	5,660	–	71,360
Over 6 in.	837	–	–	83,227	25	555	–	84,644
Over 12 in.	–	–	–	20	–	–	–	20
Total Yellow Perch	60,537	–	–	89,247	25	6,215	–	156,024
White Perch:								
Over 6 in.	–	–	–	79,297	–	–	–	79,297
Over 12 in.	–	–	–	–	–	–	–	–
Total White Perch	–	–	–	79,297	–	–	–	79,297
Pike Perch:								
Fry	–	–	–	500,000	–	–	–	500,000
Muskallonge:								
Fry	–	–	–	50,000	–	–	–	50,000
Smelt Eggs	–	–	–	–	–	–	–	–
Sunfish	–	–	–	–	25	–	–	25
Total	–	–	–	–	25	–	–	25
Total Trout and Pond Fish:								
Eggs	101,664	–	–	–	–	–	–	101,664
Fry	–	–	–	550,000	–	–	–	550,000
1 in. and over	1,452,062	49,100	298	383,550	80	798,066	163	2,683,319
Total	1,553,726	49,100	298	933,550	80	798,066	163	3,334,983
In addition the following were distributed during the period of December 1, 1938 to November 30, 1939:								
Forage Fish	900	–	–	800	–	–	–	1,700

Brook Trout. — There were 43,550 brook trout purchased in the course of the year.

At the close of the year there are on hand at all of the stations 304,837 fingerlings, 48,552 yearlings, and 3,298 adult fish.

Brown Trout. — There were 2,700 brown trout purchased.

At the close of the year there are on hand at the stations at Palmer, Sunderland and Sutton, 186,700 fingerlings, 85,152 yearlings, and 1,425 adult fish.

Rainbow Trout. — There were 8,000 rainbow trout purchased.

At the close of the year there are on hand at the stations at East Sandwich, Montague, Palmer, Sandwich and Sutton, 132,000 fingerlings, 127,442 yearlings, and 2,238 adult fish.

Atlantic Salmon. — At the close of the year there are on hand at the East Sandwich State Fish Hatchery, 85,639 fingerlings and 13,357 yearlings.

Muskallonge. — The Conservation Department of New York furnished 50,000 fry, all of which were planted in the Connecticut River.

Pike Perch. — The Conservation Department of New York furnished 500,000 fry, all of which were planted in the Connecticut River.

The distribution of game birds and animals to open covers is detailed in the following table:

Game Distributed for the Period December 1, 1938, to November 30, 1939
(This table does not show stock transferred from one game farm to another, nor does it show additions to brood stock)

	Product of State Game Farms				Not Product of State Game Farms	Total
	Liberated direct to covers	Wintered by clubs for liberation in spring of 1940	Day-old pheasant chicks distributed for rearing	Distributed for exhibit, study, etc.	Liberated direct to covers	
Pheasants:						
Young	14,241	150	2,737	–	–	17,128
Adult	8,200	–	–	6	600	8,806
Quail:						
Young	7,876	–	–	–	120	7,996
Adult	605	–	–	2	1,458	2,065
Cottontail Rabbits	230*	–	–	–	–	230*
White Hares	–	–	–	–	7,706	7,706

Note: In addition to the above, 8 Reeves pheasants at the Ayer State Game Farm were liberated.
*From Penikese Island and the Ayer State Game Farm.

Pheasants. — At the close of the year there are on hand at the four game farms 11,867 (1939-hatched) and 982 adults.

Quail. — At the close of the year there are on hand at the four game farms 1,096 (1939-hatched) and 486 adults.

Raccoons. — At the close of the year there are on hand at the Ayer State Game Farm 27 adults.

Ruffed Grouse. — At the close of the year there are on hand at the Wilbraham State Game Farm 17 young and 8 adults.

Chukar Partridge. — At the Sandwich State Game Farm there are 54 young and 12 adults on hand.

Cottontail Rabbits. — At Penikese Island there were trapped and shipped to the mainland for liberation 197 cottontail rabbits.

White Hares. — An order was placed for 8,000 white hares (trapped in Canada) to be imported for liberation, of which 7,706 were received and liberated.

MARINE FISHERIES

With the passage of Chapter 491 by the General Court in the current year and its approval as of August 12, the offices of the State Inspector of Fish and the State Supervisor of Marine Fisheries were abolished and the work of these sections was taken out of the Division of Fisheries and Game and transferred to the newly-created Division of Marine Fisheries.

Although the activities of these offices from Dec. 1, 1939 to August 12, 1940 were actually conducted as a part of the Division of Fisheries and Game, it has been deemed advisable, for reasons of economy and because a great portion of their work consists of statistical analyses covering the entire year, to embody the activities of the entire year in one report under the Division of Marine fisheries, to which the reader is referred.

Acknowledgments

I desire to express herewith my deep appreciation of the valuable assistance and cooperation received by the Division of Fisheries and Game from many sources during the past year, which includes the entire personnel of the Division, and which has made the work of all most enjoyable, pleasant and successful. Also to the many sportsmen and sportsmen's organizations throughout the State, with whom I have experienced personal contact and whose desires have been sincere and for the benefit of the Commonwealth, I express my gratitude.

Further acknowledgement is extended to Dr. David L. Belding of the Boston University School of Medicine, and to Dr. E. E. Tyzzer of Harvard Medical School, in the examination of specimens of fish and game; as well as to the State Department of Public Health in making water analyses at the Sutton State Fish Hatchery.

James E. Agnew,
Director of the Division of Fisheries and Game.

APPENDIX I

Section 4 of Chapter 499, Acts of 1939 requires the inclusion, in annual reports, of all rules and regulations promulgated by the respective departments and divisions.

The regulations made by the Division of Fisheries and Game during the fiscal year 1939 appear in this report under "Enforcement of the Game and Inland Fish Laws"; and those made prior to that year, but still in effect, follow:

July 14, 1931.

Rules and Regulations for the Artificial Propagation and Maintenance of Fish, in accordance with Section 51, Chapter 131, General Laws

1. Fish shall be said to be artificially propagated and maintained in artificial reservoirs or natural ponds containing less than twenty acres or non-navigable brooks or streams if measures are taken to encourage the natural or artificial propagation thereof; or, if they are supplied with food or otherwise cared for.
2. The fish shall be propagated and maintained under conditions that give the permittee exclusive control over them.
3. Any inlet or outlet of such reservoirs or natural ponds shall be suitably screened to insure exclusive control or to prevent the mingling of wild fish with those propagated, and all such brooks or streams shall be screened within the limits of the premises of the permittee.
4. Such waters in which fish are propagated and maintained shall be conspicuously posted to that effect and the posters shall be signed with the name of the permittee and his permit number.
5. If fish are taken from said waters for any purposes other than propagation there shall be affixed to each fish a metallic tag bearing the word "Mass." and the number of the permit, before being transported from the premises.
6. The Director may require of an applicant for a permit a working description or survey of the premises and waters and such additional information as he may deem necessary.
7. The permittee shall keep a record of all fish disposed of whether for propagation or otherwise, which shall be furnished to the Director within ten days following a written request.
8. The premises and records shall be open to the inspection of the Director or his agents.
9. The burden of proof shall rest upon the permit holder at all times to show that he is operating in conformity with these rules and regulations.

Prescribed by authority of Section 51, Chapter 131, General Laws.

Approved as to form.
Charles F. Lovejoy,
Assistant Attorney General.

Raymond J. Kenney, Director,
Division of Fisheries and Game

Approved: Charles O. Bailey
(For) Commissioner of Conservation

Approved in Council.
August 5, 1931.
William L. Reed,
Executive Secretary.

May 31, 1934.

An Order Suspending the Provisions of Law Relative to the Taking of Bass in the Westfield River

In accordance with the provisions of Section twenty-five of Chapter one hundred and thirty-one of the General Laws, as amended by Chapter thirty-three of the Acts of nineteen hundred and thirty-four, I herewith order that on and

after June 1, 1934, the law relative to the season, legal length and bag limit on black bass be suspended in that part of the Westfield River, sometimes called the East Branch of the Westfield River, in so far as it has been leased in accordance with said section. I further order that no minnows or shiners shall be taken from said waters for commercial purposes or with a net exceeding thirty-six square feet in area.

RAYMOND J. KENNEY
Director, Division of Fisheries and Game

February 18, 1935.

In accordance with the provisions of Section 24-A, Chapter 131 of the General Laws, Ter. Ed., as inserted by Chapter 78 of the Acts of 1932, I herewith establish as restricted areas in the unnavigable streams herein named, and close said restricted areas to all fishing from April 1, 1935 to April 1, 1940.

Bachelder Brook	Rowley	Full length
Daniels Brook	Rowley	All except upper ⅓ mile
Dresser Brook	Rowley	Full length
Taylor Brook	Rowley	Full length
Magoon Brook	Boxford	Full length
Chandler Brook	Boxford	Lower quarter-mile
Buckman Brook	Athol	From Newton Res. to mouth
Collar Brook	Royalston and Orange	Full length
Fish Brook	Royalston and Orange	Full length
Fall Brook	Royalston	Full length (in Mass.)
Nancy Whipple Brook	Royalston	Full length (in Mass.)
Newton Brook	Athol	Full length (in Mass.)
Tully Brook	Warwick	From Sheomet Club Pond to source
West Gulf Brook	Athol	Full length
North Branch Brook	Sandisfield	From Atwater Pond to mouth
Cold Spring Brook	Otis	From Otis-Sandisfield town line to mouth
Palmer Brook	Becket	From Ward Pond to source
Cobb Brook	Hawley	Full length
Hawkes Brook	Hawley	From source to its junction with Hicks Brook
Hicks Brook	Hawley	Full length
Temple Brook	Hawley	Full length
Wetherbee Brook	Charlemont	Full length

RAYMOND J. KENNEY
Director, Division of Fisheries and Game

February 27, 1935.

Regulations on Public Fishing Grounds

In accordance with the provisions of Section 25 of Chapter 131 of the General Laws, Ter. Ed. as amended, and in accordance with the authority therein vested in me, I herewith declare the following regulation to apply to the leased areas hereinafter named—

> "Whoever sets, maintains or increases a fire within the area leased for public fishing grounds on any of the following-named streams, shall be punished by a fine not exceeding twenty dollars."

Westfield River (commonly called the East Branch, in the towns of Huntington, Chesterfield and Cummington.
Westfield River (Middle Branch), in the towns of Huntington, Chester, Middlefield and Worthington.
Westfield River (West Branch), in the towns of Huntington, Chester, Middlefield and Becket.
Farmington River, in the towns of Sandisfield, Tolland and Otis.
Clam River, in the town of Sandisfield.
Buck River, in the town of Sandisfield.
Millers River, in the towns of Montague, Erving, Wendell, Athol, Royalston and Phillipston.
Copicut River, in the town of Dartmouth and the city of Fall River.
Shingle Island River, in the town of Dartmouth.
Squannacook River, in the town of Townsend.

RAYMOND J. KENNEY
Director, Division of Fisheries and Game

March 12, 1935.

In accordance with the provisions of Section 24-A, Chapter 131 of the General Laws, Ter. Ed., as inserted by Chapter 78 of the Acts of 1932, I herewith establish as restricted areas in the unnavigable streams herein named, and close said restricted areas to all fishing from April 1, 1935 to March 1, 1940 inclusive—

Pearl Hill Brook	Ashby and Townsend	Full length
Trap Fall Brook	Ashby	From where State Highway (Route 119) crosses it, to mouth
Willard Brook	Ashby and Townsend	From lower pond at Mill Village, to mouth
Gulf Brook	Savoy	From Burnett Pond to mouth
Tannery Brook	Savoy	Full length
South Branch Brook	Sandisfield	Full length

RAYMOND J. KENNEY
Director, Division of Fisheries and Game

June 26, 1935.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated April 11, 1935 from the Selectmen of the Town of Sharon), I hereby set aside as a breeding area for all fish for five years from July 1, 1935, the following described area:

> That portion of Lake Massapoag in the Town of Sharon which is known as the South Cove and which is set off by a line running westerly from the end of a point on the northeast corner of South Cove, which corner is owned by Mr. Dubinsky, and intersecting the westerly shore at a point just south of a duck blind.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

RAYMOND J. KENNEY
Director of Fisheries and Game

January 31, 1936.

Pursuant to the authority contained in Section 60 of Chapter 131, General Laws, Tercentenary Edition, I hereby establish the Deerfield River and its diverted waters as a restricted area for the purpose of breeding and developing trout.

The regulations (in addition to the provisions of Sections 57, 58 and 59, Chapter 131, General Laws, Tercentenary Edition), shall apply to said area as indicated in regulations numbered one and two.

1. Fishing may be done only with a single rod and line attached, to be held in the hand.
2. In the town of Charlemont and beginning at the re-inforced concrete bridge that crosses the Deerfield River west of the village of Charlemont, then upstream to the Vermont-Massachusetts State line, fishing is restricted to the use of artificial lures.

The establishment of the above mentioned restricted area and the regulations applying become effective (as provided by said Section 60) when approved by the Governor and Council and upon that date rescinds the regulations approved on March 20, 1935.

Patrick W. Hehir
Director of the Division of Fisheries and Game

Approved in Council.
February 5, 1936.
William L. Reed,
Executive Secretary.

October 8, 1936.

Regulations, Section 40, Chapter 131, General Laws.

Having caused Crane Pond in the town of West Stockbridge to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

November 1, 1936 to May 29, 1937, both dates inclusive; and from
November 1, 1937 to May 29, 1938, both dates inclusive; and from
November 1, 1938 to May 29, 1939, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

Patrick W. Hehir
Director of Fisheries and Game

October 27, 1936.

Regulations, Section 40, Chapter 131, General Laws

Having caused Sabbatia Lake in the town (or city) of Taunton to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

November 1, 1936 to May 29, 1937, both dates inclusive; and from
November 1, 1937 to May 29, 1938, both dates inclusive; and from
November 1, 1938 to May 29, 1939, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

Patrick W. Hehir
Director of Fisheries and Game

October 31, 1936.

Regulations, Section 40, Chapter 131, General Laws

Having caused Wenham Lake in the town (or city) of Carver to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

November 1, 1936 to May 29, 1937, both dates inclusive; and from
November 1, 1937 to May 29, 1938, both dates inclusive; and from
November 1, 1938 to May 29, 1939, both dates inclusive.

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director of Fisheries and Game

December 2, 1936.

Regulations, Section 40, Chapter 131, General Laws.

Having caused Great Pond (also called Ashfield Lake) in the town of Ashfield to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

December 5, 1936 to May 29, 1937, both dates inclusive
November 1, 1937 to May 29, 1938, both dates inclusive
November 1, 1938 to May 29, 1939, both dates inclusive

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated December 19, 1936 from the Selectmen of Pembroke) I hereby set aside as a breeding area for all fish for five years beginning February 15, 1937, the following described area:

> That portion of Little Sandy Bottom Pond in the town of Pembroke lying northerly of a line drawn from a painted post set at a point north of Mayflower Grove, easterly to a painted post set at wooded point south of northerly group of cottages.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

PATRICK W. HEHIR
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated October 10, 1936 from

the Selectmen of Hanson) I hereby set aside as a breeding area for all fish for five years beginning January 1, 1937, the following described area:

That portion of Indian Head Pond in the town of Hanson lying northerly of a line drawn from a painted post set at the Thomas Gunning Stand, easterly to a painted post set at north gunning stand on point near Pembroke Town Forest.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

PATRICK W. HEHIR
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated December 19, 1936 from the Selectmen of Pembroke) I hereby set aside as a breeding area for all fish for five years beginning February 15, 1937, the following described area:

That portion of Furnace Pond in the town of Pembroke lying southerly from a painted post set at the north side of the entrance to the ditch connecting Furnace with Oldham Pond to a painted post set on the Pulling Over Shore or the Narrows near the former Charles Eaton estate. This line would run southeasterly from the so-called ditch.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

PATRICK W. HEHIR
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition (and having received a petition dated November 18, 1936 from the Selectmen of Halifax and a petition dated October 10, 1936 from the Selectmen of Hanson) I hereby set aside as a breeding area for all fish for five years beginning January 15, 1937, the following described area:

That portion of West Monponsett Lake in the towns of Halifax and Hanson lying westerly of a line drawn from a post painted white set in the shore on the west side of what is known as the Ike Bourne gunning stand on the northerly side of said lake to a post painted white set in the shore at a pronounced point on land known as the Winebrook Cranberry Company land, said point being easterly of what was known as Courrier gunning stand on the southerly side of said lake.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

PATRICK W. HEHIR
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated November 18, 1936 from the Selectmen of Halifax) I hereby set aside as a breeding area for all fish for five years beginning January 15, 1937, the following described area:

That portion of East Monponsett Lake in the town of Halifax lying easterly of a line drawn from a post painted white set on the shore 60 feet easterly from the last cottage, known as the Yakavonis land, on the northerly side of said lake to a post painted white set in the shore at the north end of the road known as the boundary of Dreamland Pines.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

Patrick W. Hehir
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated October 10, 1936 from the Selectmen of Hanson) I hereby set aside as a breeding area for all fish for five years beginning January 1, 1937, the following described area:

That portion of Maquan Pond, Hanson lying southerly of a line drawn from a painted post set at Campfire Girls' land, westerly to a painted post set at Reynolds.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

Patrick W. Hehir
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated September 27, 1936 from the Selectmen of East Bridgewater) I hereby set aside as a breeding area for all fish for five years beginning January 1, 1937, the following described area:

That portion of Robbins Pond, East Bridgewater lying southerly of a line drawn from a point at Keith Gunning Stand, easterly to a painted post set at the easterly end of the Cape Cod Cranberry Dykes.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

Patrick W. Hehir
Director of Fisheries and Game

December 28, 1936.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated December 19, 1936

from the Selectmen of Pembroke) I hereby set aside as a breeding area for all fish for five years beginning February 15, 1937, the following described area:

That portion of Stetsons Pond in the town of Pembroke lying southerly of a line drawn from a painted post set on the pond shore at Columbia Road, easterly to a painted post set at Blackmans East Point.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

PATRICK W. HEHIR
Director of Fisheries and Game

January 15, 1937.

In accordance with the provisions of Chapter 131, General Laws, Tercentenary Edition, as amended by Chapter 294, Acts of 1936, I herewith declare the following rules and regulations relative to seasons, legal lengths, bag limits, and license requirements, to apply to Wallum Lake, in the town of Douglas, all dates inclusive:

Species	*Open Season*	*Daily Bag limit*	*Minimum legal length*
Yellow Perch	May 1 to last day of February	15	6 inches
Pickerel	May 1 to last day of February	10	12 inches
Pike perch	May 1 to last day of February	5	12 inches
White perch	May 1 to last day of February	15	6 inches
Horned pout	May 1 to last day of February	30	—
Muscallonge	May 1 to last day of February	5	12 inches
Trout	May 1 to July 31	5	9 inches
Black bass	July 1 to last day of February	6	10 inches

No person shall, in fishing through the ice, use more than five tilts, commonly known as tip-ups or traps, and said tilts shall be personally attended by the licensee and may be set and tended between the hours of sunrise and sunset.

All male persons fifteen years of age and over, except patients at the State Sanitarium, Wallum Lake, Burrillville, Rhode Island, while fishing in Wallum Lake in the town of Douglas shall have upon their person a license to fish, said license being issued by either Massachusetts or Rhode Island authorities as provided by law. Any citizen of Massachusetts or Rhode Island, so licensed, may fish in that portion of Wallum Lake in the town of Douglas as may Rhode Island or Massachusetts citizens fish in said lake in the state of Rhode Island in accordance with similar regulations in effect in the State of Rhode Island —said regulations having been jointly agreed upon by the proper officials of the state of Rhode Island and the Commonwealth of Massachusetts as provided in the instant statute.

PATRICK W. HEHIR
Director, Division of Fisheries and Game
Commonwealth of Massachusetts

March 10, 1937.

In accordance with Chapter 131 of the General Laws, Tercentenary Edition, as amended by Chapter 329, Section 18, of the Acts of 1933, I hereby establish the following regulations concerning the taking of smelt:—

Pursuant to Chapter 131, General Laws, Tercentenary Edition, as amended by Chapter 329, Section 18, of the Acts of 1933, it shall be unlawful to take

smelt from any great pond of the Commonwealth at any time for any purpose whatsoever.

Regulations dated May 1, 1923, are herewith revoked.

PATRICK W. HEHIR, Director

Approved in Council.
March 16, 1937
William L. Reed
Executive Secretary

May 3, 1937.

In accordance with the provisions of Section 24-A, Chapter 131 of the General Laws, Ter. Ed., as inserted by Chapter 78 of the Acts of 1932, I herewith establish as restricted areas in the unnavigable streams herein named, and close said restricted areas to all fishing between the dates given below.

That portion of the lower end of Parker Brook, Pittsfield, which flows through property owned by the Young Women's Home Association adjoining Onota Lake from May 3, 1937 to March 31, 1941.

That portion of Punkshire Brook, Canton, which flows through property controlled by the Water Commissioners of the town of Canton from May 3, 1937 to March 31, 1941.

*That portion of Jones River Feeder Brook, Kingston, which flows through property owned by Henry Nelson from May 3, 1937 to March 31, 1942.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

May 6, 1937.

In accordance with the provisions of Section 25 of Chapter 131 of the General Laws, Ter. Ed. as amended, and in accordance with the authority therein vested in me, I herewith declare the following regulation to apply to the leased areas hereinafter named:—

"Whoever sets, maintains, or increases a fire within the area leased for public fishing grounds on any of the following-named streams shall be punished by a fine not exceeding twenty dollars."

Westfield River (commonly called the East Branch), in the towns of Huntington, Chesterfield, and Cummington.

Westfield River (Middle Branch), in the towns of Huntington, Chester, Middlefield and Worthington.

Westfield River (West Branch), in the towns of Huntington, Chester, Middlefield and Becket.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

September 27, 1937.

In accordance with the provisions of Section 24-A, Chapter 131 of the General Laws, Ter. Ed., as inserted by Chapter 78 of the Acts of 1932, I herewith

*This portion of the regulation is inoperative, owing to the fact that the person who signed the lease is not the owner.

establish as a restricted area the unnavigable stream herewith named, and close said restricted area to all fishing from August 1, 1937 to August 1, 1942.

Brook	*Town*	*Distance Closed*
Leary's Brook	Hingham	Entire length

PATRICK W. HEHIR
Director, Division of Fisheries and Game

October 25,1937.

Regulations, Section 41, Chapter 131, General Laws

Pursuant to the provisions of Section 41, Chapter 131, General Laws, Tercentenary Edition, (and having received a petition dated December 19, 1936 from the Selectmen of Pembroke, and a petition dated February 3, 1937 from the Selectmen of Hanson) I hereby set aside as a breeding area for all fish for five years beginning November 1, 1937, the following described area:

> That portion of Oldham Pond in the town of Pembroke, lying easterly from a line drawn from a painted post set at the most northerly point of what is called the Oldham Goose Club beach to a painted post set at southwesterly point of Peters Cove.

Whoever fishes in this area while it is set apart as a breeding area shall forfeit his license and shall be punished by a fine of not less than ten nor more than twenty-five dollars.

PATRICK W. HEHIR
Director of Fisheries and Game

November 1, 1937.

Regulations, Section 40, Chapter 131, G. L.

Having caused Massapoag Pond in the towns of Dunstable, Groton and Tyngsboro to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

November 1, 1937 to May 29, 1938, both dates inclusive
November 1, 1938 to May 29, 1939, both dates inclusive
November 1, 1939 to May 29, 1940, both dates inclusive

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director of Fisheries and Game

Regulations, Section 40, Chapter 131, G. L.

Having caused Center Pond in the town of Becket to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

December 20, 1937 to May 29, 1938, both dates inclusive
November 1, 1938 to May 29, 1939, both dates inclusive
November 1, 1939 to May 29, 1940, both dates inclusive

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director of Fisheries and Game

Regulations, Section 40, Chapter 131, G. L.

Having caused Watson's Pond in the town of Taunton to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

January 31, 1938 to May 29, 1938, both dates inclusive
November 1, 1938 to May 29, 1939, both dates inclusive
November 1, 1939 to May 29, 1940, both dates inclusive

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

Patrick W. Hehir
Director of Fisheries and Game

February 25, 1938.

To His Excellency the Governor and the Honorable Council:

I herewith ask your approval of the following rules and regulations relative to the taking of salmon from the waters of the Commonwealth:—

In accordance with the provisions of Chapter 131, Section 61, General Laws, Tercentenary Edition, and subject to the approval of the Governor and Council, I herewith make the following rules and regulations relative to the taking of salmon, said rules and regulations to supersede the rules and regulations dated July 13, 1921.

1. Except as otherwise provided, it shall be unlawful at any time to take, possess, buy, sell, or offer for sale a salmon taken from any of the waters of this Commonwealth.
2. No salmon may be taken from the waters of the Commonwealth that are less than twelve inches in length.
3. The open season on salmon shall be from April 15, to November 30, both dates inclusive, except that the open season in Plymouth and Barnstable counties shall be from March 1, to November 30, both dates inclusive.
4. No person shall in any one day take a total of more than five salmon.
5. These regulations shall not apply to salmon taken in coastal waters by use of traps and seines other than purse seines and sweep seines, nor shall they be construed to permit the fishing of salmon in any of the waters stocked and closed at the request of the town or city governments or closed by the Director under authority of Chapter 131, section 40, General Laws, Tercentenary Edition, or in public water supplies, except as provided by the regulations posted near such ponds.

Respectfully submitted,
Patrick W. Hehir
Director

Approved in Council
March 2, 1938
William L. Reed, Executive Secretary

April 14, 1938.

Rules and Regulations governing the taking of Fish in the Areas leased by the Division for Public Fishing Ground Purposes in the Copicut River in the Towns of Dartmouth and Fall River, and the Shingle Island River and Flag Swamp Brook in the Town of Dartmouth.

In accordance with the provisions of Section 25 of Chapter 131, General Laws, Tercentenary Edition, as most recently amended, I herewith declare the following rules and regulations governing the taking of fish from the Copicut River

in the towns of Dartmouth and Fall River, and the Shingle Island River and Flag Swamp Brook in the town of Dartmouth, as leased by the Division for Public Fishing Ground purposes, to be effective this date:

That no fish be taken nor any attempt be made to take fish by any person in the above mentioned waters between August 1 and April 14 of the following year, both dates inclusive.

And, in that portion of the Copicut River commonly known as the Job Cornell Pond, fishing is limited to the use of artificial flies.

Any person taking or attempting to take fish in violation of these rules and regulations shall be punished by a fine of not exceeding twenty dollars.

The foregoing regulations shall remain in effect until revoked by a similar order and supersede all outstanding regulations governing fishing in the above-named waters.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

Regulations, Chapter 131, Section 40, G. L. Ter. Ed.

Having caused Laurel Lake in the towns of Lee and Lenox to be stocked with fish in accordance with Section 40, Chapter 131, of the General Laws, Tercentenary Edition, I hereby close said pond and its tributaries to all fishing from:

April 15, 1938 to May 29, 1938, both dates inclusive
November 1, 1938 to May 29, 1939, both dates inclusive
November 1, 1939 to May 29, 1940, both dates inclusive

I hereby prescribe a penalty of twenty dollars for each violation of these regulations.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

March 7, 1938.

Regulations, Chapter 131, Section 40, G. L. Ter. Ed.

Having caused Stiles Pond in the town of Boxford to be stocked with fish in accordance with Chapter 131, Section 40, General Laws, Tercentenary Edition, I hereby close said pond to all fishing from:

November 1, 1938 to April 14, 1939, both dates inclusive
November 1, 1939 to April 14, 1940, both dates inclusive

I hereby prescribe a penalty of twenty dollars for each violation of the regulations.

The regulations become effective April 15, 1938, and supersede all previous regulations.

PATRICK W. HEHIR
Director, Division of Fisheries and Game

APPENDIX II

Following is the complete record of the clubs which received stock from the Division, in consideration of having purchased and liberated game birds or fish with their own funds:

	Pheasants	*Quail*	*Brook Trout*	*Rainbow Trout*
Affiliated Clubs of Western Franklin County	102			
Agawam Sportsmen's Club			350	
Auburn Sportsmen's Club, Inc.	50			
Barnstable County League of Sportsmen's Clubs	24			
Bass River Rod and Gun Club	30			
Bird Dog Club		25		
Bourne Rod and Gun Club				100
Brockton Sportsmen's Association, Inc.	54			
Cape Cod Fish and Game Association		30		
Central Massachusetts Bird Dog Club	50			
Connecticut Valley Field Dog Club	50			
Connecticut Valley Game Bird Association	60			
Dedham Hunting and Fishing Club	32			
Eastern States Bird Dog Association, Inc.	110			
Easthampton Fish and Game Association	44			
Fall River Rod and Gun Club		48		
Fairview Sportsmen's Fish and Game Association, Inc.	80			
Fitchburg Rod and Gun Club	28			
Forestdale Rod and Gun Club	26			
Gardner Fish and Gun Club	50		1,250	
Great Barrington Fish and Game Association	50		100	
Greenfield Rod and Gun Club	70			
Hamilton Rod and Gun Club	36			
Highland Fish and Game Club	40			
Hingham Sportsman's Club	25		428	
Holliston Sportsman's Club	6			
Holyoke Fish and Game Association	27			
Lake Massapoag Rod and Gun Club	10			
League of Essex County Sportsmen's Clubs	86			
Leicester Rod and Gun Club	35			
Lowell Sportsman's Club	62			
Ludlow Fish and Game Club, Inc.	35		400	
Maynard Rod and Gun Club	25			
Marlboro Fish and Game Association, Inc.	50		600	
Mattapoisett Fin, Fur and Feather Club	17			
Methuen Rod and Gun Club, Inc.	22			
Metropolitan Rod and Gun Club	12			
Middlesex County Field Trial Club	17	35		
Monson Rod and Gun Club	60			
Middleboro Fish and Game Club	50			
Nantucket Sportman's Club	50			
Natick Fin, Fur and Feather Club	200			
Needham Sportsman's Club, Inc.	70	36		
Nimrod League of Holden, Inc.	50			
Nipmuc Rod and Gun Club	10			
North Adams Sportsman's Club	90			
Northfield Fish and Game Association	30			
North Shore Sportsmen's Club	65		750	

	Pheasants	*Quail*	*Brook Trout*	*Rainbow Trout*
Oregon Sportsmen's Club	35			
Quinobequin Rod and Gun Club	15			
Riverside Gun Club of Hudson	40			
Rochester Feather and Fin Club	22			
Sandisfield Rod and Gun Club			460	
Scituate Rod and Gun Club	16			
Setter Club of New England		60		
Singletary Rod and Gun Club	30			
South Barre Rod and Gun Club	20			
South Chelmsford Gun and Rod Club	12			
South Hadley Sporting Club	125			
South Seekonk Gun Club, Inc.	42			
Spencer Fish and Game Club	45			
Spencer Sportsmen's Club			500	
Taunton Fish and Game Association	19			
Turners Falls Fish and Game Club	15			
Uxbridge Rod and Gun Club	50			
Wakefield Wildlife Restoration Club	100			
Wankinquoah Rod and Gun Club	30		100	
Webster and Dudley Fish and Game Club	28			
Westboro Fish and Game Club	85			
West Warren Fish and Game Club	50		300	
Whitinsville Fish and Game Club	40			
Wilbraham Fish and Game Club	100			
Woburn Sportsmen's Association	70			
Woodville Rod and Gun Club	27			
Worcester County Fish and Game Association	100		8,000	
Worcester County League	121			
Wrentham Sportsmen's Association	25			
	3,352	234	13,238	100